1916–1917.

(Twelfth Year of the Meteorological Committee.)

SEVENTIETH MEETING.

South Kensington, S.W., 10th May, 1916.

PRESENT :

THE DIRECTOR, IN THE CHAIR.

MR. BARSTOW.	MAJOR LYONS.
THE HYDROGRAPHER.	MR. MIDDLETON.

572. SUMMER TIME BILL, 1916.—Submitted—draft text of a Bill introduced in the House of Commons by the Home Secretary on 9th May, providing that for general purposes the time in Great Britain from 2 a.m. G.M.T. 21st May, 1916, to 2 a.m. G.M.T. on 1st October, 1916, shall be one hour in advance of Greenwich Mean Time, and for a similar change in time reckoning in any subsequent year during the continuance of the war, as may be fixed by Order in Council. The Bill applies to Ireland in the same way as to Great Britain with the substitution of references to Dublin Mean Time for references to Greenwich Mean Time. A clause in the Bill provides that the use of Greenwich Mean Time shall not be affected for purposes of astronomy or navigation.

It was agreed in the event of the Bill becoming law—(1) that the work at the observatories of the Meteorological Office (stations of the first order) should continue to be regulated according to Greenwich Mean Time, and that self-recording instruments maintained by the Office elsewhere should continue to indicate Greenwich Mean Time.

(2) That stations of the second and third orders should be recommended to continue the use of Greenwich time for the regulation of their work.

(3) That "health-resort stations" now reporting temperature, rainfall, sunshine, and weather daily by telegraph at 18h. G.M.T. for communication to the newspaper press should be allowed to report at 17h. G.M.T. instead, provided that separate returns are made of the amount of sunshine for "to-day till 17h." and for "yesterday after 17h."

(4) That rainfall stations should be allowed to select either 8 a.m. or 9 a.m. local time as the hour of observation.

(5) That as regards the daily weather service, the established hours of observation, viz., 1h., 7h., 13h., 18h. G.M.T., should be continued for the present, but that negotiations be opened with France and other countries for a permanent change to the scheme 0h., 6h., 12h., 18h. G.M.T.

It was further agreed that the nominal hours of attendance at the Office should remain as at present, except for duties connected with the daily weather service, and other duties for which special provision would be made as required.

573. METEOROLOGICAL FIELD SERVICE (Minute 568).—Read—the following letter from the War Office :—

121/8246 (C.3). War Office,
London, S.W.,
30th April, 1916.

SIR,

I AM commanded by the Army Council to inform you that it has been represented to them that it would be an advantage if some one were appointed to be the official medium of communication between the War Office and the Meteorological Office as regards the Meteorological Service in the Field, and to state, that in these circumstances, they have nominated Major H. G. Lyons, R.E., F.R.S., as their representative on your Committee for the purpose of keeping the Committee in touch with War Office requirements in connection with Meteorology.

I am, &c.,
B. B. CUBITT.

The Chairman,
Meteorological Committee,
Meteorological Office,
South Kensington, S.W.

Reported—that no reply had been received from the War Office to a letter dated 22nd January, 1916, suggesting that a reserve unit, consisting of 2 Subalterns and 10 Corporals should be authorised for the Meteorological Section.

It was agreed that it is desirable that two new commissions should be authorised to be held by the two professional assistants in the Office who are qualifying themselves for appointment to the Meteorological Section to replace casual vacancies or to meet an extension of the service.

574. OFFICE STAFF.—**Enlistments.**—Reported—that the following members of the Office Staff had been called up for Military Service, and that permission to enlist had been granted in each case :—

M. T. Spence, Clerk-Assistant (Minutes 533, 559), who had obtained a Sub-Lieutenant's Commission in the Royal Naval Air Service, and left on 15th April.

A. G. Goad, Store-keeper (Minute 568), who had enlisted as Corporal in the Royal Engineers, with a view to service with the Meteorological Field Service, and left on 4th April.

E. T. Streets, probationer, joined on 28th March.

H. T. Smith, probationer, joined on 8th May.

G. J. Barker, boy clerk, joined on 5th April.

It was agreed that army pay be made up to civil pay in the cases of Messrs. Smith and Barker, but not in the case of Mr. Streets, who had been appointed since the outbreak of war to fill a temporary vacancy caused by an enlistment.

Read—memorandum by the Cashier on the state of the account with the Committee, of Sergeant Pyser, of the Meteorological Section.

Approved.

Resignation.—Reported—that Miss D. M. Buckeridge, shorthand-typist, wished to leave the service of the Office, in consequence of her approaching marriage on 3rd June.

It was agreed to make suitable provision for Miss Buckeridge's work, in conjunction with the appointment of a girl-clerk or probationer as storekeeper in place of A. G. Goad, enlisted.

New Appointments.—*Eskdale Observatory* (Minute 568).—Reported—that a meeting of the Gassiot Committee had been held on 5th April, and that the Committee had recommended for appointment for one year, as Superintendent of Eskdale Observatory, A. Crichton Mitchell, D.Sc., of 103, Trinity Road, Edinburgh, formerly Director of Public Instruction, Travancore, India. Dr. Mitchell retired from India three years ago, and had meanwhile been engaged on research work in the Physical Laboratory at Edinburgh University.

The following draft Minute had accordingly been circulated to the Meteorological Committee for approval on 27th April, and the Committee's approval of the Minute had been communicated to Dr. Mitchell on 4th May :—

ON the recommendation of the Gassiot Committee A. Crichton Mitchell, D.Sc., is appointed Superintendent of the Observatory at Eskdalemuir for one year from May 16th, 1916, in place of Mr. L. F. Richardson, resigned.

The appointment is subject to the regulations of Minute 385. The salary is £400, with a deduction of £50 for rent of the Superintendent's House.

Dr. Crichton Mitchell is allowed to use during the year the furniture left in the house by Mr. Richardson, with ordinary wear and tear allowed. The Office will make payment of £30 to Mr. Richardson for the use of the furniture on those terms. Dr. Crichton Mitchell undertakes the obligation of making good any detriment beyond ordinary wear and tear.

In the circumstances of the war ordinary leave of absence can only be given in favourable circumstances, but no objection will be raised to occasional absences for a day or two at a time to attend meetings of the Council of the Royal Society of Edinburgh and other scientific duties.

Provision for the year beyond 15th May, 1917, will be considered, and notified before 15th January, 1917.

Dr. Mitchell has attended at the Observatory from 17th April, and is being shown the various departments of Observatory work by Mr. Richardson, whose duties under the Committee terminate on 15th May.

Approved.

Reported—order 483, recommending for appointment as girl-clerk on the usual terms, Margaret Enderby, born 17th August, 1898, as from 8th May, 1916, to fill a vacancy in the Statistical Division due to enlistment.

Approved.

Reported—that it is proposed to offer an appointment as girl-clerk, on the usual terms, for work in connexion with the Réseau Mondial to Miss Anna Brown, born 18th February, 1899.

Approved.

Boy clerks.—*Rates of pay.*—Reported—that at the end of 1915, on the representation by the Superintendent that the wages of boys with good school education were exceptionally high in the district, the wages of John Beck, boy clerk, had been increased by 2*s.* beyond the prescribed scale for Establishments outside the London District. Order No. 466.

Approved.

575. DIRECTOR'S REPORT AND ACCOUNTS.—**Telegrams to Pembroke Air Station.**—Reported—letter (1534/C.11) from Sub-Lieut. Spence (Minute 574), dated 6th May, on behalf of the Commanding Officer, R.N. Airship Station, Milton, Pembroke, asking if arrangements could be made for daily telegrams at 7 a.m. from Irish telegraphic reporting stations to Milton, giving the 7 a.m. observations in order that local forecasts of weather may be made at Milton.

A copy of the letter had been forwarded to the Director of the Royal Naval Air Service, with the request that the general question of the supply of meteorological information to the Royal Naval Air Service should be taken up.

It was agreed that the Committee could not accede to the request for information to be reported directly from the stations elsewhere than to the Office.

M.O. Press.—Reported—that two orders for lithographic printing had been forwarded by H.M. Stationery Office on behalf of the Admiralty to the M.O. press, which is already shorthanded and finds the work of the Office quite sufficient. The practice appears to be contrary to the contract between the Stationery Office and Messrs. Wyman and Sons, Ltd.

Accounts.—*Travelling Expenses.*—Payment of the travelling expenses, amounting to £4 12*s.* 11*d.*, of Mr. and Mrs. T. Harris, for the journey to Falmouth and back, in accordance with instructions, was authorised.

SEVENTY-FIRST MEETING.

South Kensington, S.W., 24th May, 1916.

PRESENT :

THE DIRECTOR, IN THE CHAIR.

THE HYDROGRAPHER.	MR. MIDDLETON.
MAJOR LYONS.	DR. SCHUSTER.

576. The Minutes (565–571 and 572–575) of the Meetings of 22nd March, 1916, and 10th May, 1916, previously circulated, were taken as read and confirmed.

577. CORRESPONDENCE.—**Lloyd's.**—Reported—correspondence with the Secretary of Lloyd's (617/Res. Mond.) with reference to the observations made voluntarily by Lloyd's signalmaster at Cape Spartel. At the outbreak of war in August, 1914, the signal station was attacked, loss of life occurred and the signalman was withdrawn. The meteorological instruments were placed in care of the principal lightkeeper, who carried on the observations and reported them to the Office until December, 1915, when the signal station was re-opened. A request is made for a small recompense for the light-house-keeper who kept the record during the absence of Lloyd's signalman.

It was agreed that payment be made as requested at the rate of £8 a year, corresponding with the rate approved for observers at stations reporting for the Weekly Weather Report (Minute 544).

Admiralty.—*Director of Naval Intelligence.*—Read—letter from the Director of Naval Intelligence, Admiralty War Staff, to Major Lyons asking if he would be so good as to continue the preparation and working out of the material in connexion with the air and other meteorological statistics for Western Europe and other countries, which Dr. Dickson will indicate, in the same manner as Major Lyons has done, with reference to various parts of Europe and Asia.

Major Lyons submitted proof of tables which had already been prepared.

It was agreed to comply with the request, and to say that a large amount of the material is already prepared in the Office, and only awaits a decision as to the form in which it should be arranged.

578. ELEVENTH ANNUAL REPORT (Minute 566).—Manuscript of a portion of the Report was laid upon the table, and it was agreed to forward it when complete to the Stationery Office for printing.

579. ACCOUNTS FOR 1915–16.—Submitted—the Statement of Accounts for the year ended 31st March, 1916, printed in Minute 586.

Comparison of Expenditure and Receipts (Minute 586) with the Estimates of Minute 507.—Submitted—the following statement of expenditure and receipts for the year 1915–16, in comparison with the Estimates of Minute 507 :—

	Service.	Voted 1915–16.	Spent 1915–16.	Excess.	Defect.	Proposed 1916–17.	
		£	£	£	£	£	£
1.	**Salaries:**						
	Office	11,463	11,415	—	48		
	Observatories	4,330	3,751	—	579	15,464	
	Insurance	45	45	—	—		
	Office Expenses:						15,464
2.	Rent, Heating, and Lighting	700	685	—	15	700	
3.	Furniture and equipment	100	230	130	—	100	
4.	Library	50	21	—	29	50	
5.	Insurances, Repairs	100	98	—	2	120	
6.	Incidental Expenses and Consumable Stores	190	234	44	—	250	
7.	Advertising Account	—	18	18	—	20	
							1,240
8.	**Stationery Office** (S.O.P.)	60	89	29	—	—	60
	Post Office Charges:						
9.	Postage	750	665	—	85	—	750
10.	Telephones	78	88	10	—	—	100
11.	Telegrams from inland stations	600	797	197	—	1,000	
12.	„ wireless messages	350	—	—	350	10	
13.	„ from abroad	525	553	28	—	525	
14.	„ sent abroad	600	2	—	598	30	
15.	„ Gale Warnings	350	246	—	104	109	
16.	„ Harvest Forecasts	120	34	—	86	50	
17.	„ sundry messages, &c.	130	33	—	97	60	
18.	Allowances to Clerks	220	214	—	6	220	
							2,004
19.	**Travelling Expenses**	400	144	—	256	—	250
	Superannuation:						
20.	Pensions not chargeable on Fund	425	425	—	—	425	
21.	„ chargeable on Fund	275	264	—	11	516	
22.	Annuities	1,012	698	—	314	712	
23.	Contribution to Fund	595	665	70	—	234	
							1,887
	Purchase of Instruments:						
24.	Royal Navy	900	2,684	1,784	—	1,000	
25.	For Office use	450	171	—	279	450	
	Other commissions	1,000	1,675	675	—	1,000	
							2,450
	M.O. Observatories (excluding salaries):						
26.	Kew	412	338	—	74	422	
27.	Eskdale	500	493	—	7	510	
28.	Valencia	240	146	—	94	225	
29.	Farnborough	125	181	56	—	250	
30.	Falmouth	220	94	—	126	173	
31.	Benson	243	44	—	199	488	
							2,068
32.	Edinburgh Office	350	373	23	—	—	375
	Auxiliary Observatories and Stations:						
33.	Subventions: Aberdeen	295	295	—	—	295	
34.	Armagh	50	50	—	—	50	
35.	British Rainfall Organization	55	55	—	—	55	
							400
36.	Salaries of Observers: 29 Telegraphic stations	670	700	30	—	670	
37.	2 Anemographic [2] Climatological					50	
							720
38.	Incidental Expenses: Cost of Forms, &c. ...	210	134	—	76	175	
39.	Agents' Fees	105	51	—	54	90	
40.	Labels	15	7	—	8	10	
41.	Postage, telephones, and telegrams.	10	23	13	—	30	
							305
	Lectures and Experiments:						
42.	Schuster Readership	350	—	—	350	—	
43.	Contribution to International Publication ...	50	—	—	50	—	
	Total	29,718	28,928	—	790	—	28,073

APPROPRIATIONS IN AID.

		Voted 1915-16.	Realized. 1915-16.	Excess.	Defect.	Proposed 1916-17.	
	Office Expenses Refunded:	£	£	£	£	£	£
44.	Departmental: Administration, &c. ...	150	102	—	48	100	
45.	Forecasts	80	5	—	75	—	
46.	Instruments	100	163	63	—	150	
							250
47.	Incidental: Administration, &c.	50	28	—	22	40	
48.	Forecasts and Daily Weather Report.	510	127	—	383	100	
49.	Instruments	25	23	—	2	25	
50.	Advertising Account	—	6	6	—	10	
							175
51.	**Stationery Office** (Sale of Publications) ...	50	70	20	—	—	60
52.	**Telegraphic Expenses Refunded:** Home	235	36	—	199	—	} 30
	Foreign	380	142	—	238	—	}
53.	**Telephone Charges Refunded**	50	9	—	41	—	—
54.	**Inspections**	200	168	—	32	—	100
55.	**Instruments:** Royal Navy	900	2,687	1,787	—	1,000	
56.	Other sources	1,000	1,346	346	—	1,000	
							2,000
57.	**Superannuation:** Interest on Fund ...	—	17	17	—	30	
58.	Annuities	1,012	746	—	266	712	
							742
	Lectures and Experiments:						
59.	Schuster Readership	350	—	—	350	—	—
60.	Other sources	—	9	9	—	—	—
	Observatories:						
61.	Kew	570	609	39	—	709	
62.	Eskdale	1,090	1,019	—	71	1,096	
63.	Valencia	30	34	4	—	30	
64.	Farnborough	315	274	—	41	271	
65.	Falmouth	10	9	—	1	10	
66.	Benson	—	12	12	—	—	
							2,116
67.	**Auxiliary Observatories and Stations** (Cost of Forms).	111	134	23	—	—	100
	Total	7,218	7,775	557	—	—	5,573

NOTES ACCOMPANYING COMPARISON OF ESTIMATES WITH EXPENDITURE.

1. Decrease mainly due to deduction of Army Pay on account of members of the Staff on War Service.
3. Furniture provided for in Estimates of 1914-15 not brought to account till 1915-16.
6. Increase is due to expenses in connexion with the Meteorological Field Service, advertising the vacancies on staff, and uniforms for Officekeepers and Storekeeper.
8. Sale of publications greater than estimated.
9. Decrease in General Postage=£30; Daily Weather Report=£50.
10. Extension line to Sydney Street, and removal of house telephones.
11. Due to 1 a.m. Service and increased cost of inland telegrams.
12. Reports by wireless stopped owing to war.
13. Additional reports in connexion with War Service.
14. Cessation of messages during war.
15. Gale warnings discontinued from November, 1915.
16, 17. Cessation of ordinary forecasts, and fewer Harvest forecasts issued.
19. Inspection work curtailed.
22. Deficit due to deduction of Income Tax, and inclusion of Mr. Gaster and Mr. J. S. Harding —since deceased, in estimate.
23. Excess due to the inclusion of the unexpended amount provided for Mr. Francis in Estimates, 1914-15.
24. Increase due to War requirements. See Appropriations, No. 55.
25. Recoverable requisitions in excess of estimate. See Appropriations, No. 56.
26. Estimate for Instruments £100, £57 spent. Estimate for Incidental Expenses £50 and £15 spent.
28. Expenses less than estimate £100 provided for Instruments and only £16 spent.
29. Increase in Post Office charges of £64.
30. Expenses less than Estimate; Equipment £47; Consumable Stores £49 and Incidental Expenses £22=£118.
31. Expenses less than estimate on Instruments £157 and on consumable stores £34, together £191.
32. Excess due to travelling expenses being charged against Edinburgh.
36. „ „ „ increase of stations for War Service.
38, 39, 40. Expenses less than estimate.
41. Expenses exceeded estimated amount.
42. Readership vacant. See Appropriations, No. 59.
43. No contribution owing to War.
44, 45, 47, 48. Restriction of services to the public due to the War.
46. Excess due to increase in recoverable requisitions.
51. Sale of publications larger than estimated.
52. Defect due to discontinuance of weather forecasts and foreign telegrams.
53. Scheme for telephone forecasts not operative on account of War.
54. Certain stations not inspected in 1915.
55, 56. See Nos. 24, 25 above.
58. See No. 22 above.
59. „ „ 42 „.
61. Receipts exceeded amount estimated.
62. Rent of Rooms (£76) not shown in accounts.
64. Wages of Laboratory Assistant, recovered from War Office, £42 less than in 1914-15.
67. Increase due to greater sale of forms.

Investments.—Submitted—that on the year's working a surplus of £1,347 is shown, which is increased to £2,076 in the statement of assets and liabilities. Of this £634 represents money provided for the development of the aerological observatory at Benson, postponed owing to the war, and a further £50 assigned for the international publication of upper air data has not been spent.

The provision for Superannuation during the year was £665, and there are several prospective demands, which the ordinary annual payment of £750 will not meet.

The Superintendent of Eskdale observatory has forwarded a report on the state of the motor car, according to which the car is no longer worth repairing (1709/CE. 51).

It was agreed—(1) That £1,000 be placed to the credit of a fund for the establishment of an aerological observatory, and other purposes connected with the experimental study of the atmosphere, and be invested with a view to its use for those purposes as soon as circumstances permit.

(2) That an additional £335 be contributed to the Superannuation fund for the clerical and technical Staff.

(3) That £265 be set aside pending a further report on the provision for conveyance and transport at Eskdalemuir.

Edinburgh Office.—*Accounts for* 1915–16—Submitted—the following statement, drawn up by the Honorary Treasurer of the Scottish Meteorological Society :—

Statement of Account of Scottish Meteorological Society with the Meteorological Committee for year ending 31*st March*, 1916.

Receipts.

	£	s.	d.
Balance carried forward	55	17	10
From the Meteorological Committee	350	0	0
On account of reports supplied to the Registrar-General for Scotland ...	100	0	0
	£505	17	10

Expenditure.

	£	s.	d.	£	s.	d.
1. Salaries—						
Superintendent ...	270	0	0			
Assistants	124	3	4			
Occasional assistance	8	12	0			
				402	15	4
Workman's Compensation Insurance				10	9	
National Health Insurance ...				1	6	0
2. Furniture and fitments				21	19	0
3. Binding official reports				1	6	0
4. Telephone—						
Rent for one year				6	0	0
5. Registration of telegraphic address				1	1	0
6. Postages, telegrams, and petty outlays				4	6	11
				£439	5	6
Balance carried forward				66	12	4
				£505	17	10

WILLIAM B. WILSON,
Hon. Treas.

Approved.

Audit of Stock of Instruments at Central Office.—Reported—that Mr. Corless had inspected and certified the Stock on 4th April, 1916, of M.O. Instruments at the Central Office, in accordance with Minute 168 (2158/400).

580. OFFICE STAFF.—Read—letter from Captain Hepworth thanking the Committee for their congratulations on his promotion (Minute 568).

It was agreed that David Brunt, B.Sc., M.A., be promoted to the rank of Senior Professional Assistant, at a salary of £225 a year, as from 1st May, 1916 (Minute 559).

New Appointments.—*Miss Anna Brown* (Minute 574).—Read—letter of 17th May (1586/W. 00) from the Sister-in-charge of St. Faith's School, Oxford, respecting the birth-certificate of Miss Brown.

It was agreed to recommend that Mrs. Brown should communicate with the police in Oxford in the matter.

Miss D. L. R. Baron.—Reported—that an appointment as girl-clerk has been offered to Miss D. L. R. Baron, born 8th August, 1899, on the usual terms.

Approved.

Enlistments.—Reported—that a number of boy-clerks and probationers now 17 or 18 years old will be affected by the new Military Service Act, which applies to men between 18 and 41. Those affected on 24th June next are C. S. Herbert, F. C. Warmington and C. V. Ockenden.

It was agreed to arrange, if possible, for their enlistment in the reserve unit of the Meteorological Section, which has been proposed for the consideration of the War Office.

581. Observatories.—**Kew.**—*Magnetism* (Minute 569).—Reported—that the question of the future of magnetic work at Kew Observatory had been considered by the Gassiot Committee on 5th April, and that the Superintendent of the observatory had subsequently prepared a form of table suitable for the publication of Kew magnetic data in the Geophysical Journal, which is submitted.

Approved.

Site of "anemometer hut."—Reported—in continuation of Minute 547 that the Golf Club had written a letter dated 1st May, 1916, to the Office of Woods, acknowledging the right of the Meteorological Committee to construct and maintain a Cowl House of similar dimensions to the structure which formerly stood on the site in question, and adding that while the exact site can still be readily identified in spite of the removal of the fence, the Golf Club would ask that the site be set back about 20 yards in an Easterly direction, as at present it is in dangerous proximity to one of the holes of the course.

At the suggestion of the Office of Woods, it is proposed to visit the observatory and, in company with the Secretary of the Golf Club, to decide upon a suitable site which could be marked upon a signed copy of an Ordnance Survey 25-inch map.

Approved.

Eskdale.—*Paper by Mr. L. F. Richardson.*—Submitted—paper by the late Superintendent, entitled "Weather Prediction by means of Arithmetical Finite Differences," which he wished to submit to the Royal Society.

582. Inspections.—It was agreed to arrange for the inspection during the coming summer of "health-resort" stations which pay the fee, £4, and of as many telegraphic reporting and climatological stations as practicable.

583. Daily Weather Service.—**Information from pilot balloon ascents at Naval Air Stations.**—Reported—that pilot balloon ascents are made regularly at 5 Naval Air Stations for their own purposes, and that the information so obtained would be useful to the Office.

It was agreed that formal application be made to the Hydrographer for the results to be communicated immediately by telegraph to the Office.

Swedish Observations.—Reported—that the Swedish authorities had discontinued the daily weather telegrams to the Office, on the ground that the messages are sent in exchange for corresponding British messages now discontinued (1087/C.11.H.)

In view of the importance of the messages in connexion with forecasts of weather for the Baltic, it was agreed to request the Hydrographer to arrange through the Foreign Office for the British representative in Sweden to telegraph the observations from Stockholm as soon as they are available to the public there.

584. Harvest Forecasts.—**Arrangements for 1916.**—It was agreed not to issue the usual circular this year advertising the service of harvest forecasts, but to send forecasts of temperature and weather for 24 hours only to those who apply for them, provided the address is approved.

585. Publications.—**Barometer Manual for the use of Seamen.**—Reported—letter (1679/O.061) dated 18th May from the Stationery Office, reporting that the stock of the seventh edition of the Barometer Manual for the use of Seamen, of which 10,000

copies were printed in November, 1912, is reduced to 24 copies, and requesting that "copy" for a new edition be prepared and forwarded. There are about 45 copies in stock at the Office.

It was agreed to ask Mr. Charles Harding, late principal assistant in the Marine Division, now retired, to edit the book for the eighth edition, under the supervision of the Marine Superintendent. The work should be done at his house, and payment at the rate of £90 a year for "half-time" service would be made, as in the corresponding case of Mr. J. A. Curtis (Minute 559).

Royal Meteorological Society.—Reported—that at the request of Captain Cave the Royal Meteorological Society had presented to the office for the library of the branch office at South Farnborough, bound volumes of the Quarterly Journal of the Society for 1877–1903, and unbound volumes for 1904–1913 (1060/L.). The unbound volumes had been bound, and the set had been forwarded to Farnborough on 22nd May.

It was agreed that the thanks of the Committee be communicated to the Society for this valuable gift.

Bloemfontein.—Reported—that at the request of the Public Library of Bloemfontein, presentation copies of certain Office publications had been forwarded to the library through the medium of the High Commissioner for South Africa (1220/L.).

Approved.

Tachkent.—Reported—that an exchange of publications had been arranged between the Office and the Hydrometric Service of Turkestan, Tachkent (1363/L.).

Approved.

586. Directors' Report and Accounts.—**Lens for Camera Obscura.**—Reported—that on the recommendation of Mr. Horace Darwin, order had been given for the purchase of a Cooke lens for use with a camera obscura at the Office or Kew Observatory, at a cost of £26 plus 10 per cent. less trade discount of 30 per cent. allowed to Government Departments.

Approved.

Summer Time Act.—Reported—the circulation to observers of the following three notices regarding the Summer Time Act, which came into effect on 21st May. (Minute 572.)

SUMMER TIME ACT.

Daily Weather Service.

The Director of the Meteorological Office gives notice—

(1) That in accordance with the Act, Greenwich Mean Time will be used as heretofore in all Meteorological Office forms, records and books of instructions issued, for describing the times of the observations and other operations at the observatories and stations in connection with the Office.

(2) Until further orders the hours of observation for the telegraphic reports of the Daily Weather Service will continue to be 1h., 7h., 13h., 18h., 21h. Greenwich Mean Time, that is at 2 a.m., 8 a.m., 2 p.m., 7 p.m., and 10 p.m. Summer Time.

Observers who have two clocks should for their personal convenience keep one of them set according to the Summer Time for summer months, that is one hour in advance of Greenwich Mean Time, and the other as heretofore, according to Greenwich Mean Time, for the purpose of verifying and recording the times of observation and other meteorological observations.

It is to be noted that according to the Observer's Handbook, p. 14: "At Meteorological Observatories the hours are numbered consecutively from midnight 0h. to midnight 24h.—the hours after noon are 13h., 14h., and so on." The same plan of numbering is used for telegraphic reporting, and is set out in "Instructions to Meteorological Telegraphy, 1914," p. 7.

It is therefore recommended that at all meteorological stations the clock which is used to show Greenwich Time for verifying and recording the times of the meteorological operations should be clearly marked by attaching to the dial or the glass a second circle of figures 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 0 within the ordinary circle of figures I, II, III . . . . XII, so that the numbering of the hours for meteorological purposes may be made easy and correct.

Observers are reminded that Greenwich Mean Time should be used for recording and reporting special phenomena in the "remarks" column, and entries at the end of telegrams, as well as for the observations at fixed hours.

The receipt of this circular should be acknowledged in the next regular telegram.

Meteorological Office,
18th May, 1916.

Summer Time Act.

Telegraphic Reports from Health Resorts.

The Director of the Meteorological Office gives notice that until further order (for the purpose of continuing the service) the Director is prepared to accept reports by telegraph of observations at the Health Resorts at 17h. G.M.T. (6 p.m. summer standard time) instead of 18h. G.M.T. as heretofore, provided that a separate return is made of the number of hours of bright sunshine of "yesterday evening (after 17h)" and of "to-day up to 17h."

The inclusion in the telegrams of the amount of sunshine recorded between 17h. and sunset involves an alteration of the telegraphic code used hitherto.

It has been the practice to measure the rainfall both at 9h. and at 18h. The differentiation between the rainfall during the night and that during the day is of special interest at health resorts, and it is proposed to take advantage of the opportunity for change offered by the Summer Time Bill to separate the night and day amounts of rainfall in the telegrams to the Meteorological Office, and in the reports to the newspaper press.

From the date of the adoption of the scheme observers at health resorts should measure the rainfall both at 9h. and at 17h.

The telegrams to the Meteorological Office should be made up of—

(*a*) Two groups of not more than five letters each, summarising the weather experienced during forenoon and afternoon respectively.

(*b*) Six groups, each of five figures, made up as follows :—

First Group—BBBDD.
Barometer reading (three figures) and direction of wind in points (two figures).

Second Group—FFWTT.
Wind force (two figures).
Weather (one figure).
Temperature of dry bulb (two figures).

Third Group—XXsss.
XX=Maximum temperature for the day.
sss=Sunshine yesterday evening between 17h. and sunset.

Fourth Group—MMSSS.
MM=Minimum temperature for the 24 hours ended 17h.
SSS=Sunshine from sunrise to 17h.

Fifth Group—rrrAA.
rrr=rainfall during the night, read at 9h. in tenths of a millimetre, or in hundredths of an inch.
Stations reporting in millimetres send figures 66 in place of AA.
" " inches send figures 77 in place of AA.

Sixth Group—RRRPP.
RRR=Rainfall during the day measured at 17h.
For PP { Stations reporting barometer reading in millibars send 33.
" " " " inches send 22.

In filling up the monthly return the complete amount of sunshine recorded between sunrise and sunset should be set down to each day. The amounts before and after 17h. need not be entered separately.

The form provides two columns for the entry of rainfall figures. These should be used to give the amounts per "day" and "night" separately as indicated in the headings to the columns.

In all other respects the instructions set out in enclosed* Circular should be followed.

Meteorological Office,
South Kensington, S.W.,
18th May, 1916.

Summer Time Act.

Climatological and Rainfall Stations.

Extract from Summer Time Act.—"Nothing in this Act shall affect the use of Greenwich Mean Time for purposes of astronomy, meteorology or navigation, or affect the construction of any document mentioning or referring to time in connexion with such purposes as aforesaid."

The Director of the Meterological Office gives notice that :—

(1) In accordance with the Act, Greenwich Mean Time will be used as heretofore in all books of instructions, forms and records issued by the Meteorological Office for describing the times of the observations and other operations at the observatories and stations in connection with the Office.

(2) The observers at Climatological Stations (Stations of the Second and Third Orders of the International Classification) should maintain the continuity of their observations at the same hours of Greenwich or Dublin Mean Time, as the case may be, as heretofore. These times will appear as an hour later on clocks set to Summer Time.

* The circular enclosed was that entitled "Summer Time Act—Climatological and Rainfall Stations," printed above.

The observers at rainfall stations are also recommended to maintain the continuity of their observations during the summer months, and in every case to make it quite clear on the forms used for the record at what hour of Greenwich Mean Time the observations have been made.

Those observers whose occupation does not allow of their maintaining the continuity of the time of their observations are requested at once to inform the Director.

Observers who have two clocks should for their personal convenience keep one of them set according to the Summer Time, that is one hour in advance of Greenwich Mean Time, and the other as heretofore, according to Greenwich Mean Time, for the purpose of verifying and recording the times of observations and other meteorological operations.

It is to be noted that according to the Observer's Handbook—

§ 3 : "At Meteorological Observatories the hours are numbered consecutively from midnight 0h. to midnight 24h.—the hours after noon are 13h., 14h., and so on." The same plan of numbering is used for telegraphic reporting.

It is therefore recommended that at all meteorological stations the clocks which are used for showing Greenwich Mean Time for verifying and recording the times of the meteorological operations should be clearly marked by attaching to the dial or the glass a second circle of figures, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 0, within the ordinary circle of figures, I, II, III . . . XII, so that the numbering of the hours for meteorological purposes may be made easy and correct.

It is also recommended for the avoiding of confusion in future that the numbering 0 to 23 be always used for the hours of Greenwich Mean Time and that a.m. and p.m. be used only for the hours of summer time, and always used for those hours.

Observers are particularly requested to make clear on each Form what time specification has been adopted both for the regular observations at fixed hours, and for the notes on special events made in the "remarks" column. It should be borne in mind that these documents are permanent records to which reference will be made in times to come when the details of changes made in 1916 will no longer be familiar.

Meteorological Office,
South Kensington, S.W.,
18th May, 1916.

Correlation inquiry.—*Iceland–Azores.*—Reported—the following result of the inquiry suggested by Dr. G. T. Walker, F.R.S., Director-General of Indian Observatories (Minute 543).

Mr. Brodie's diagram of correlation co-efficients for the 15 years, 1900–01 to 1914–15, suggested February as the likeliest month for which high correlations could be obtained. Another reason in favour of February was that, if high correlations had been found, they could have been put to practical use immediately.

In order to obtain a greater number of observations the three 10-day periods in February were grouped together, thus giving a total number of observations of 45.

The correlation co-efficients obtained on this basis of 45 observations were :—

Correlation Co-efficient.	Variables Correlated.		
$-\cdot44\pm\cdot08$	Kew-Paris-Helder temperature.		Iceland pressure 10 days before. (Feb. 1–10 with Jan. 21–31 „ 11–20 „ Feb. 1–10 „ 21–28 „ „ 11–20)
$+\cdot27\pm\cdot09$	„	„	Malta pressure 10 days before.
$+\cdot20$	„	„	K-P-H temperature 10 days before.
$+\cdot10$	„	„	Stockholm pressure 10 days before.
$+\cdot04$	„	„	K-P-H pressure 10 days before.
$+\cdot01$	„	„	Azores pressure 10 days before.
Zero	„	„	Iceland pressure the next but one preceding 10-day period. (Feb. 1–10 with Jan. 11–20 „ 11–20 „ „ 21–31 „ 21–28 „ Feb. 1–10)
$\cdot06$	„	„	Azores pressure the next but one preceding 10-day period.

Regression equations obtained :—

$$\left.\begin{array}{l}\text{K-P-H temperature deviation}\\ \text{from normal}\end{array}\right\} = -\cdot16 \left\{\begin{array}{l}\text{Iceland pressure deviation from}\\ \text{normal for previous 10 days}\end{array}\right\} + \cdot84$$

$$\left.\begin{array}{l}\text{K-P-H temperature deviation}\\ \text{from normal}\end{array}\right\} = -\cdot14 \left\{\begin{array}{l}\text{Iceland pressure}\\ \text{deviation from}\\ \text{normal for pre-}\\ \text{vious 10 days}\end{array}\right\} + \cdot05 \left\{\begin{array}{l}\text{Malta pressure}\\ \text{deviation from}\\ \text{normal for pre-}\\ \text{vious 10 days}\end{array}\right\} + \cdot84$$

These equations only apply to K-P-H temperature for the 10-day periods :—

February 1–10.
February 11–20.
February 21–28.

The only result arrived at is, that during February, if the pressure in Iceland for a 10-day period is below normal the Kew-Paris-Helder mean temperature for the next 10-day period is likely to be above normal, and *vice versa*. No other 10-day pressure means appear to be correlated with 10-day temperature means at Kew-Paris-Helder.

In the above regression equations, temperatures are measured in degrees Fahrenheit, and pressure in millibars.

The normals for the periods to which the equations refer are :—

	Kew-Paris-Helder Temperature, °F.	Iceland Pressure, mb.	Malta Pressure mb
January, 21–31		1002·0	1017·1
February, 1–10	35·6	1003·9	1016·4
„ 11–20	36·4	1005·2	1015·7
„ 21–28	36·8		

Map of Stations and Wall Case.—Reported—that at the Director's request, the Ordnance Survey had been good enough to prepare from the published Sectional Maps a large Wall Map of the British Isles, scale 10 miles to the inch, showing heights stereographically and to mount it on canvas.

Reported further—that with the concurrence of the Office of Works, a glass wall case had been ordered of F. Sage & Co., Ltd., at a cost of £17 7*s*. 6*d*., in which the map may be exhibited on the staircase (794/D.19). It is proposed to indicate on the map the positions of the stations in connexion with the Office, and the character of the information received from each.

Approved.

Bureau of British Health Resorts.—Reported—newspaper cutting from the "Observer" regarding a Bureau of British Health Resorts which had been established in Norfolk Street, Strand, for the purpose of giving full information, free of charge, to invalid British Officers as to the best places in which to recuperate, having regard to climate, soil, altitude, &c.

Professor of Meteorology.—Submitted—the following reports for March and April, 1916, from the Professor of Meteorology :—

March, 1916.—The greater part of a chapter on eddying motion in the atmosphere has been written, and a chapter on the propagation of sound in the atmosphere has been begun.

The design of pilot bombs designed to hang below an aeroplane bomb, and to explode the main bomb at a height above the ground by means of an electric cable when the pilot bomb strikes the ground, has been investigated. An experimental study of the effect of the wind on the connecting wire was made. The results have been communicated to the Advisory Committee for Aeronautics. (See Reports T. 703 and T. 703a). The difficulty in making the pilot bomb travel ahead of the main bomb was solved by pivoting the pilot bomb at its centre of gravity ; but the investigation is not yet quite complete.

A fairly complete investigation has been made, in all possible cases, of the dynamics of the F.A.F. Fiery Grapnel when its wire strikes a Zeppelin. It was found that some designs would necessarily fail under certain conditions of striking, owing to the development of excessive tension in the wire. These designs were therefore abandoned. The dynamics of the final design was investigated and found to be satisfactory under all conditions. The problem proved one of considerable difficulty, and was solved by step-by-step methods which involved the solution of simultaneous equations for each step.

The curve assumed by a wire towing a weight through the air behind an aeroplane was investigated. The results were embodied in the form of a non-dimensional curve, which applies to all possible sizes and lengths of wire and to all weights.

The transmission of heat from a solid to a fluid flowing past it was investigated. The investigation was not complete at the end of March, but it has since been finished and will be communicated to the Advisory Committee for Aeronautics in May.

April, 1916.—During the early part of the month an investigation was carried out on the proper dimensions for the cooling fins of aeroplane engines. Calculations were made to find the relationship between the rate of cooling at the surface, and the temperature of the fins at different distances from the cylinder wall.

The case of a fin of triangular section was worked out in detail. Experiments were carried out at the R.A F. on the temperatures at the base and at the tip of a cooling fin of an engine on an aeroplane in flight, and the velocity of the wind past the fin was measured. The results of these observations were then used in the calculations, and the amount of cooling was found. It turned out to be about nine times as great as that assumed by Mr. Lanchester.

Formulæ are found which give the ratio that the thickness must bear to the height in order that a fin of given weight may radiate a maximum amount of heat, and a table is drawn up giving the best dimensions for iron and for aluminium fins when cooled by a wind of 75 miles per hour. It is found that in the regions between the cylinders where the wind velocity is about 75 miles per hour, iron fins should be much shorter and thicker than they are at present; but that the fins on an R.A.F. engine would be of about the right dimensions if the cylinder were made of aluminium. A report on the research has been written and will be communicated to the Advisory Committee for Aeronautics shortly.

Observations have been started with a view to finding the rate at which the wind falls off close to the ground. A spot close to the edge of Farnborough Common was selected and three anemometers were set up at heights of one, four, and six feet above the ground. The observations are not yet complete, but the results obtained so far seem to indicate that the wind velocity at a height of four feet is about 85 per cent., and the wind at one foot about 66 per cent. of the velocity at a height of six feet. So far as the observations have gone, there does not seem to be any indication that these ratios depend on the velocity of the wind at a height of six feet, but no very definite information can be given till more observations have been taken.

During the last week of April, I paid a visit to the Expeditionary Force in order to gather information regarding the actual weather conditions which make observations from aeroplanes and kite balloons useless. On this visit I was accompanied by Captain Cave, R.E. We stayed with the officers of the Meteorological Section mess at G.H.Q., 2nd Echelon, who did all they could to make our stay both pleasant and profitable.

The following is a diary of our visit:—

Easter Day, April 23rd.—Journey out.

Monday, April 24th.—Visited meteorological station. The country is flat and seems favourable for wind observations, but is all sown with corn; and it seems probable that it will be difficult to get good wind observations from the top of a pole four feet high when the corn grows up. The rate of variation of wind velocity at small heights above the ground is referred to in another part of this report. The figures given suggest that when the corn is grown measurements made by means of an air meter placed on a pole projecting one foot above the level of the top of the corn might be expected to give a wind velocity 77 per cent. lower than those obtained at a height of four feet above the level of the top of the corn.

Tuesday, April 25th.—Spent the day at R.F.C. Headquarters looking up the records of the number of successful and unsuccessful flights made during the last five months.

Wednesday, April 26th.—Visited 2nd Brigade, R.F.C., and in the afternoon went on to the 1st and 5th Squadrons.

Thursday, April 27th.—Visited G.H.Q. 1st Echelon in morning; spent afternoon working in the M.O.

Friday, April 28th.—Captain Cave returned to England.

Saturday, April 29th.—Visited Kite Balloon Squadron and Kite Balloon Section.

Sunday, April 30th—Returned to London.

In answer to my enquiries the C.O. of the 5th Squadron, 2nd Wing, informed me that haze and low clouds and rain are the only meteorological conditions which put a stop to his reconnaissances. Reconnaissances can be done in almost any kind of wind, provided the weather is clear, and there are no low clouds. He was unable to say at all definitely what proportion of the unsuccessful flights failed owing to the weather, and what proportion failed owing to engine trouble, enemy guns, enemy aircraft or other causes unconnected with the weather; he hazarded a guess, however, that it was about half. It is sometimes possible, apparently, to carry out artillery reconnaissance successfully from over our own lines when the clouds are so low as to make it impossible to send a machine for tactical reconnaisance over the enemy's lines.

There are also certain meteorological conditions in which a blue haze renders all reconnaissance impossible except photographic reconnaissance. The use of a screen which cuts out the blue rays makes it possible to photograph through a haze which renders objects on the ground almost invisible.

The C.O. of the 1st Squadron gave substantially the same information as the C.O. of the 5th Squadron; and he added the further information that bumps sometimes makes reconnaissance very difficult, owing to the movement of the machine, especially in the case of small machines like the Moranes, of which his squadron is partly composed. "Bumps" are due both to wind and sun,

but the bumps due to the sun alone are never sufficiently violent to interfere much with reconnaissance. He confirmed what the C.O. of the 5th Squadron said about haze, and told us that on hazy days the Germans can frequently see our lines in the morning when we cannot see theirs, while in the evening the conditions are reversed, and we can see them, but they cannot see us. This is evidently due to the fact that when the sun is low in the sky more light is scattered towards the observer by the small particles of which the haze is composed, when he is looking through haze which lies between himself and the sun, than when he is looking away from the sun.

The C.O. of the 1st Squadron also said that he made use of the weather forecasts, and that he was specially glad to have the forecast, which has recently been sent out, of the probable amount of cloudiness.

There was some diversity of opinion among the C.O.'s of Squadrons and Sections as to the value of the forecasts. Most of them seemed to find them useful. Col. Longmore, commanding 2nd wing, for instance, mentioned two cases in which the forecasts of a gale had enabled him to save his machines from destruction. One of the Kite Balloon commanders, on the other hand, was of opinion that wind reports and forecasts were of little use to him because, he said, unless the wind is obviously too strong for the balloon, it is very little trouble to send the balloon up to find out what wind there is, and if a sudden storm comes up there is always time to get the balloon down before the wind gets too strong for it. It is possible, however, that he may have altered his opinion since then, because a sudden storm did in fact recently break away a large number of French kite balloons before they could be brought down. It seems probable that if warnings could be given when a sudden storm might be expected, kite balloon commanders could be instructed as to what signs in the sky would indicate its near presence. They might then haul down their balloons in time. In this way it is possible that one might avoid a recurrence of the disaster in the future, and at the same time avoid pulling down the kite balloon until there was some immediate danger of a sudden storm.

Major Bovill, C.O., of a Kite Balloon Squadron, said that he finds the forecasts most useful. He was of opinion that the wind velocity given by the Meteorological Office, as a result of its early morning pilot balloon ascent, is often too low. It is known that the wind velocity close to the ground is lower in the early morning than it is later in the day, but the average wind at a height of 1000 feet is actually higher in the early morning than it is later in the day. The difference cannot be attributed to differences in position between the Meteorological Office and the Kite Balloon Stations, because it has been found that the wind velocity at 2,000 feet is surprisingly uniform over the British Army area. It is therefore difficult to see why there should be a difference between the velocity of the wind, in which the kite balloon flies at a height of about 2,500 feet, and the wind observed at that height by the Meteorological Office. On the whole I am inclined to think that the effect may be psychological.

In fine weather reconnaissances are frequently stopped by haze. It is well known that haze frequently forms close to the ground in the evening and in the morning owing to condensation, but a haze which prevents reconnaissance is frequently recorded on days when the air close to the ground was quite dry. One cannot ascribe the haze on these occasions to condensation. It seems probable, therefore, that they are composed of dust particles. The habit which the French have of throwing lumps of soft chalk on the road to provide binding for their roads may have something to do with the phenomenon. It seems that nearly all this chalk must ultimately blow off the roads in the form of dust.

It seemed to be the opinion of flying officers that haze was rather worse in the northern half of the British Army area than in the southern half. This may be due to the fact that the soil retains its moisture longer in the north than in the south, at any rate there seems to be very little difference in the composition of the surface, dust-producing earth in the two regions.

Reports of Work.—Reports of work for the divisions of the Office and the Observatories for the months of March and April are being duplicated and will be circulated among the Superintendents. It is proposed to file one copy in the Office and one copy at Kew, Eskdale, Valencia and Farnborough, and, in future, to note in the Minutes the fact of the circulation of the papers, instead of printing them in full.

Accounts.—Submitted—The following statement of the Bank Account in the Cash Book :—

	£	s.	d.
Balance on 21st March, 1916	2,400	1	11
Receipts from 22nd March to 23rd May, 1916	8,743	0	8
	11,143	2	7
Cheques drawn from 22nd March to 23rd May, 1916	5,542	3	11
Balance on 23rd May, 1916	£5,600	18	8

Submitted—The following Statement of Accounts for the Year ending 31st March, 1916, prepared for audit by the Comptroller and Auditor-General:—

RECEIPTS.						PAYMENTS.					
1914-15.				1915-16.		1914-15.				1915-16.	
£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.		£ s. d.	
1,250 16 8	Balance from year 1914–15	—		861 16 6		1,000 0 0	Director...	—		1,000 0 0	
20,000 0 0	Parliamentary vote .	—		22,500 0 0			OFFICE SALARIES (including Insurance):				
						8,205 2 11	Monthly	9,152 19 5			
	DEPARTMENTAL EXPENSES REPAID:					1,092 19 8	Weekly	1,292 9 1			
95 17 1	Forecasts, &c. ...	4 17 5								10,445 8 6	
	Marine, Statistical, and Administrative						EXPENSES OF OFFICE:				
81 0 10		101 10 0				684 3 7	Rent, Heating, and Lighting	685 3 3			
188 16 11	Instruments ...	163 9 10					Furniture and Equipment				
				269 17 3		25 17 1		229 11 11			
	INCIDENTAL EXPENSES REPAID:					40 16 8	Library	21 4 10			
301 18 10	D.W. Report ...	126 14 0				241 1 10	Insurances, Repairs, Incidental Expenses, and Consumable Stores ...	331 11 11			
72 13 1	Divisional... ...	50 18 5									
10 7 0	Advertising Account	6 4 1				—	Advertising Account ...	17 14 2			
				183 16 6						1,285 6 1	
90 12 6	STATIONERY OFFICE	—		70 1 5		773 8 2	POST OFFICE: Postage	665 3 3			
						83 1 10	Telephones	87 15 10			
	TELEGRAPH					2,391 17 1	Telegrams	1,879 12 7			
518 5 3	CHARGES REPAID	—		178 6 7						2,632 11 8	
						47 8 10	STATIONERY OFFICE ..	—		88 17 5	
	TELEPHONE										
10 11 10	CHARGES REPAID	—		8 12 0		261 8 2	TRAVELLING EXPENSES	—		143 19 5	
176 13 0	INSPECTIONS ...	—		168 0 0			SUPERANNUATION:				
						425 0 0	Pensions not chargeable on Fund ...	425 0 0			
	INSTRUMENTS:						Pensions chargeable				
420 8 0	Royal Navy ...	2,687 8 9				132 13 6	on Fund	263 12 10			
	Mercantile Marine,					950 0 0	Annuities	697 10 0			
2,404 2 7	Stations, &c. ...	1,345 11 5				541 0 0	Contribution to fund	665 1 6			
				4,033 0 2						2,051 4 4	
	SUPERANNUATION ACCOUNT:						COST OF INSTRUMENTS:				
955 4 11	Annuities... ...	745 12 8				423 8 0	Royal Navy	2,684 8 9			
	Interest on Investment						For Office use ...	171 5 0			
10 3 0		16 10 1				2,979 2 4	Other Commissions ...	1,675 6 8			
				762 2 9						4,531 0 5	
	OBSERVATORIES, BRANCHES, AND STATIONS:						*OBSERVATORIES, BRANCHES, AND STATIONS:				
						2,575 4 7	Kew	2,023 4 1			
658 8 9	Kew	608 13 10				1,470 16 6	Eskdale	1,418 2 3			
1,015 16 0	Eskdale	1,019 9 6				554 2 5	Valencia	637 5 9			
29 5 3	Valencia	34 3 8				619 11 11	Farnborough	403 2 10			
315 13 0	Farnborough ...	273 10 9				147 14 3	Falmouth	190 13 0			
9 9 7	Falmouth... ...	9 6 4				541 16 10	Benson	389 13 1			
—	Benson	12 0 0					Edinburgh	372 16 0			
105 5 3	Miscellaneous ...	134 5 11				1,732 9 2	Miscellaneous ...	1,314 7 8			
				2,091 10 0						6,749 4 8	
	LECTURES AND EXPERIMENTS ...						LECTURES AND EXPERIMENTS ...				
236 17 6		—		9 4 9		156 5 0		—		—	
							BALANCE:				
						790 5 10	Cash at Bank... ...	2,131 0 4			
						71 10 8	,, at Office ...	77 15 1			
										2,208 15 5	
28,958 6 10				£31,136 7 11		£28,958 6 10				£31,136 7 11	

* For details, *see* separate statement.

Statement of Assets and Liabilities at 31st March, 1916.

LIABILITIES.				ASSETS.			
£ s. d.		£ s. d.		£ s. d.		£ s. d.	
2,021 17 9	To sundry creditors	2,149 13 5		861 16 6	By cash at Bank and at Office ...	2,208 15 5	
—	,, superannuation	5 18 6		36 7 8	,, salaries reserved (premiums) ...	36 8 2	
246 18 10	,, balance	2,322 11 8		380 13 2	,, M.O. instruments in stock	444 1 2	
				815 0 9	,, sundry debtors	904 15 8	
				174 18 6	,, Admiralty	884 3 2	
£2,268 16 7		£4,478 3 7		£2,268 16 7		£4,478 3 7	

NOTE.—On 31st March the amount of Government securities held for the provision of Superannuation Annuities was £26 14*s.* 2*d.* per cent. Consols, and £702 10*s.* 2*d.* 4½ per cent. War Loan.

NET EXPENDITURE, 1915–1916.

	£ s. d.	£ s. d.
SALARIES :		
Director		1,000 0 0
Office	10,445 8 6	
Kew	1,685 12 3	
Eskdale	924 13 11	
Valencia	490 17 11	
Farnborough	221 17 6	
Falmouth	96 15 0	
Benson	345 13 3	
	14,210 18 4	
Less : Deptl. Exs. 269 17 3		
Bal. Trav. Ex. ... 24 0 7	317 8 7	
(Farn) War Office 23 10 9		
		13,893 9 9
GENERAL ADMINISTRATION OF CENTRAL OFFICES :		
Rent, Heat and Lighting ...	685 3 3	
Furniture and Equipment ...	229 11 11	
Library	21 4 10	
		936 0 0
Insurances, repairs, incidental expenses, &c. Advertising account...	349 6 1	
Less : repayments	183 16 6	
	165 9 7	
Add ⅔ of incidental D.W.R. ...	84 9 4	
		249 18 11
Postage	665 3 3	
Less : ⅔ of incidental D.W R....	84 9 4	
		580 13 11
TELEGRAMS	1,872 12 7	
Less : repayments	178 6 7	
		1,701 6 0
TELEPHONES...	87 15 0	
Less : repayments	8 12 0	
		79 3 10
Carried forward ...		18,440 12 5

	£ s. d.	£ s. d.
Brought forward ...		18,440 12 5
STATIONERY OFFICE	88 17 5	
Less : receipts...	70 1 5	
		18 16 0
TRAVELLING EXPENSES	143 19 5	
Less : inspection receipts ...	168 0 0	
Credit (see above) ...	24 0 7	
SUPERANNUATION	2,051 4 4	
Less : repayments	762 2 9	
		1,289 1 7
INSTRUMENTS	4,531 0 5	
Less : repayments	4,033 0 2	
		498 0 3
OBSERVATORIES (other than Salaries)		
KEW	537 11 10	
Less : repayments	56 16 3	
		280 15 7
ESKDALE...	493 8 4	
Less : repayments	19 9 6	
		473 18 10
VALENCIA	146 7 10	
Less : repayments	23 2 6	
		123 5 4
FARNBOROUGH	181 5 4	
Less : repayments	—	
		181 5 4
FALMOUTH	93 18 0	
Less : repayments	9 6 4	
		84 11 8
BENSON	43 19 10	
Less : repayments	12 0 0	
		31 19 10
MISCELLANEOUS	1,314 7 8	
Less : repayments	134 5 11	
		1,180 1 9
EDINBURGH	—	372 16 0
LECTURES AND EXPERIMENTS	0 0 0	
Receipts	9 4 9	
Credit	9 4 9	
Net expenditure		22,975 4 7
Credit		9 4 9
Net total		£22,965 19 10

Grants :	£ s. d.
Meteorological Office	22,500 0 0
Eskdale	1,000 0 0
Advisory Committee	250 0 0
Gassiot Trust...	387 17 7
Rosse Trust	11 1 2
Scott Antarctic Fund	164 0 0
	24,312 18 9
Balance on 1st April	861 16 6
	£25,174 15 3
Total net expenditure	22,965 19 10
Balance on 31st March	2,208 15 5
	£25,174 15 3

Observatories.—Statement of Accounts for the Year ended 31st March, 1916 :—

KEW.

1914–15. £ s. d.	*Receipts.*	£ s. d.	1915–16. £ s. d.
164 0 0	Subvention, Scott Antarctic Fund	164 0 0	
339 2 0	Gassiot Trust	387 17 7	
		551 17 7	
57 2 3	Expenses refunded locally ...	4 12 11	
84 13 6	Tests and Commissions	30 11 6	
13 11 0	Cost of books and forms refunded	21 11 10	
1,916 15 10	Balance	1,414 10 3	
£2,575 4 7			£2,023 4 1

1914–15. £ s. d.	*Payments.*	£ s. d.	1915–16. £ s. d.
1,509 2 3	Salaries, Scheduled	1,657 10 3	
23 17 7	Sunday and holiday duty	28 2 0	
82 18 6	Assistance to Caretaker...	—	
			1,685 12 3
32 16 9	Cost of forms, &c.		26 11 0
574 7 3	Rent, Rates, Taxes, Repairs and Insurance		73 15 11
97 4 5	Fuel and lighting		107 14 5
182 10 8	Equipment and instruments ...		57 18 1
14 14 6	Consumable stores		18 5 3
14 5 10	Incidental expenses		15 9 8
8 1 1	Books, &c.		4 19 8
33 4 3	Postage, telephones and telegrams		30 18 6
2 1 6	Travelling expenses		2 5 4
£2.575 4 7			£2,023 4 1

Eskdale.

1914–15. £ s. d.	*Receipts.*	1915–16. £ s. d.	1914–15. £ s. d.	*Payments.*	1915–16. £ s. d.
1,000 0 0	Subvention, Royal Society	1,000 0 0	1,032 18 7	Salaries, Scheduled	924 13 11
15 16 0	Expenses refunded locally	19 9 6	54 10 1	Cost of forms, &c.	72 9 3
455 0 6	Balance	398 12 9	34 6 8	Rent, Rates, Taxes, Repairs and Insurance	50 12 5
			177 15 1	Fuel and lighting	151 19 0
			34 16 7	Equipment and instruments	43 7 11
			40 1 2	Consumable stores	68 19 4
			12 9 10	Incidental expenses	17 12 5
			11 3 0	Books, &c.	9 9 2
			30 0 0	Postage, telephones and telegrams	37 19 0
			42 15 6	Travelling and motor car expenses	40 19 10
£1,470 16 6		£1,418 2 3	£1,470 16 6		£1,418 2 3

Valencia.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
11 15 3	Subventions (Rosse Fund)	11 1 2	443 2 6	Salaries, Scheduled	490 17 11
17 10 0	Expenses refunded locally	23 2 6	3 13 10	Cost of forms	4 2 0
524 17 2	Balance	603 2 1	71 11 4	Rent, Rates, Taxes, Repairs and Insurance	84 10 5
			15 13 11	Fuel and lighting	18 3 0
			7 4	Equipment and instruments	16 2 3
			8 6	Consumable stores	5 17 2
			1 0 0	Incidental expenses	18 9
			—	Books, &c.	1 0 4
			13 5 0	Postage, telephones and telegrams	14 0 6
			5 0 0	Travelling expenses	1 13 5
£554 2 5		£637 5 9	£554 2 5		£637 5 9

Farnborough Branch Office.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
250 0 0	Subvention (Advisory Committee for Aeronautics)	250 0 0	482 10 11	Salaries, Scheduled	221 17 6
			11 3	Cost of forms	—
65 13 0	Expenses refunded (War Office)	23 10 9	—	Overtime, &c.	1 8
303 18 11	Balance	129 12 1	9 9	Rent, Rates, Taxes, Repairs and Insurance	7 9
			9 2 5	Equipment and instruments	13 18 8
			13 17 0	Consumable stores	17 4 9
			5 6	Incidental expenses	3 2
			1 16 2	Books, &c.	2 15 0
			81 1 4	Postage, telephones and telegrams	103 13 5
			29 17 7	Travelling and motor car expenses	43 0 11
£619 11 11		£403 2 10	£619 11 11		£403 2 10

Falmouth Weather Station.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
9 9 7	Expenses refunded locally	9 6 4	30 0 0	R. Cornwall Polytechnic Society	30 0 0
138 4 8	Balance	181 6 8	60 18 6	Salaries, Scheduled	96 12 6
			2 1 2	„ Additional	2 6
			14 10	Rent, Rates, Taxes, Repairs and Insurance	14 6
			10 10 10	Equipment and instruments	13 0 2
			1 17 9	Consumable stores	3 7 10
			13 6	Incidental expenses	17 1
			28 4 4	Postage, telephones and telegrams	51 16 2
			12 13 4	Travelling expenses	14 2 3
£147 14 3		£190 13 0	£147 14 3		£190 13 0

Benson.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
16 6 0	Expenses refunded locally	12 0 0	340 14 6	Salaries, Scheduled	344 12 9
541 16 10	Balance	377 13 1	4 0	Overtime, &c.	1 0 6
			5 0	Cost of forms, &c.	—
			18 9	Rent, Rates, Taxes, Repairs and Insurance	2 0 0
			15 0	Fuel and Lighting	1 8 10
			106 5 3	Equipment and instruments	3 13 2
			50 2 4	Consumable stores	25 15 2
			7 0 0	Incidental expenses	3 1 5
			50 16 0	Books, &c.	—
			1 0 0	Postage, telephones and telegrams	8 1 3
			2 0	Travelling expenses	—
£558 2 10		£389 13 1	£558 2 10		£389 13 1

Meteorological Office, Edinburgh.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
361 0 6	Balance	372 16 0	350 0 0	Subvention	350 0 0
			11 0 6	Travelling expenses	22 16 0
£361 0 6		£372 16 0	£361 0 6		£372 16 0

Miscellaneous Stations.

1914–15.			*Receipts.*			1915–16.		
£	s.	d.				£	s.	d.
105	5	3	Cost of forms refunded	...	...	134	5	11
1,266	3	5	Balance ...	...	...	1,180	1	9
£1,371	8	8				£1,314	7	8

1914–15.			*Payments.*				1915–16.		
£	s.	d.		£	s.	d.	£	s.	d.
344	10	0	Subventions, Aberdeen Armagh	344	10	0			
25	0	0	British Rainfall Organization ...	55	0	0			
50	0	0	Royal Meteorological Society ...	—					
							399	10	0
665	8	5	Salaries of Observers (31)				699	6	1
	13	6	Overtime					6	0
158	16	6	Cost of forms, &c.				118	12	0
6	3	0	Rent, Rates, Taxes, Repairs and Insurance				11	13	8
	14	3	Equipment and instruments ...				1	13	3
	1	6	Consumable stores					18	2
90	14	4	Agents' fees, &c.				51	13	4
1	3	6	Books, &c.				7	5	0
28	3	8	Postage, telephones and telegrams				23	10	2
£1,371	8	8					£1,314	7	8

Meteorological Field Service.

France.

Receipts.							*Payments.*							
£	s.	d.				£	s.	d.		£	s.	d.	£	s.	d.
—			War Office	344	3	8	—			Salaries :					
—			Balance	437	7	2	—			Major E. Gold (Gazetted 28th September) ...	160	14	0		
							—			Lieut. A. E. M. Geddes (Gazetted 4th June)	56	2	6		
							—			Lieut. A. H. R. Goldie (Gazetted 18th June)	40	15	6		
							—			Lieut. E. H. Chapman (Gazetted 27th July)		—			
							—			Lieut. C. D. Stewart (Gazetted 27th July)	24	17	0		
							—			Lieut. F. Entwistle (Gazetted 23rd August)	7	6	10		
							—			Lieut. J. G. Lamb (Gazetted 7th February)	29	15	5		
							—			Lieut. J. W. Bispham (Gazetted 3rd March)	1	4	2		
							—			Sergt. R. Pyser ...	16	9	5		
							—			Corpl. E. L. Clinch ...	1	3	0		
														338	7	10
							—			Salaries : Overtime ...				5	19	8
										Incidental Expenses :					
							—			Postage	9	5	8		
							—			Telegrams		—			
							—			Printed books ...	2	4	11		
							—			Miscellaneous... ...	12	3	6		
														23	14	1
							—			Instruments				413	9	3
—				£781	10	10	—							£781	10	10

Dardanelles.

£	s.	d.		£	s.	d.	£	s.	d.	Salaries :	£	s.	d.	£	s.	d.
—			Admiralty	129	1	5	—			Capt. E. M. Wedderburn (Gazetted 25th September)	15	12	6			
—			Balance	303	2	6	—			Lieut. E. Kidson (Gazetted 22nd November)	13	15	0			
														29	7	6
							—			Salaries : Overtime ...				41	5	2
										Incidental Expenses :—						
							—			Postage	1	3	0			
							—			Telegrams	162	3	7			
							—			Printed books ...		—				
							—			Typewriter	9	9	0			
							—			Miscellaneous... ...	3	15	3			
														176	10	10
							—			Instruments				185	0	5
—				£432	3	11	—							£432	3	11

SEVENTY-SECOND MEETING.

South Kensington, S.W., 28th June, 1916.

PRESENT :

THE DIRECTOR, IN THE CHAIR.

CAPTAIN HARVEY.	MAJOR LYONS.
THE HYDROGRAPHER.	MR. MIDDLETON.

DR. SCHUSTER.

587. The Minutes (576–586) of the last Meeting (24th May, 1916), previously circulated, were taken as read and confirmed.

588. OBITUARY.—Reported—the death of Robert Henry Scott, M.A., D.Sc., F.R.S., which occurred at his residence, 6, Elm Park Gardens, S.W., on 18th June, 1916. Dr. Scott was Director of the Meteorological Office from 1867 to 1877, and Secretary of the Meteorological Council from 1877 to 1900. For many years he acted as Secretary of the International Meteorological Committee, and at the time of his decease he held the office of Foreign Secretary of the Royal Meteorological Society.

It was agreed to send a letter of condolence, on behalf of the Committee, to his niece Miss Scott.

589. ACCOUNTS FOR 1915–16 (Minute 579).—The comparison of expenditure and receipts with the estimates for 1915–16, as presented in Minute 579, was considered, and the expenditure in excess of the estimates was approved.

590. ELEVENTH ANNUAL REPORT (Minute 578).—Submitted—manuscript of the complete report with the exception of a note on Office Property to be added.

Approved.

591. OFFICE STAFF.—**Establishment.**—Submitted—letter 1884/DW.00 from Major E. Gold asking if "the decision of three or four years ago to fix the maximum of the salary of the Superintendent of Statistics at £500 per annum can be reconsidered" on the ground that "the salary is without pension and is consequently less than the maximum salary of a second class clerk in a Government Office."

Submitted also—letter 2260/DW.00 from Mr. R. G. K. Lempfert, Superintendent of the Forecast Division asking that the compulsory deduction from his salary on account of endowment assurance for superannuation, should not be reckoned as salary, because no deduction from the assessment for income tax of the amount so set aside for superannuation is allowed on the ground that the policy does not include a life assurance, and the provision for superannuation in the Civil Service is not subject to income tax.

It was ruled that the Committee could not withdraw from the Surveyor of Income Tax the cognisance that a specific sum was set aside to provide a superannuation allowance under a definite policy of insurance : it was pointed out that the pensions in the Civil Service were at the discretion of the Treasury, and were not granted in pursuance of any legal obligation to an individual.

The Director presented a memorandum setting out a proposal for revising the Office establishment having in view the two applications above mentioned, also the appointment of a successor to Captain Hepworth on his retirement, and provision for collecting and publishing reliable records of rainfall of the British Isles contemplated in Treasury letter 13038/15 (Minute 541) which suggested informal discussion of the subject with Dr. Mill and the Scottish Meteorological Society.

The memorandum set out the need for a succession of grades in the professional staff of the Office that would afford adequate careers for a limited number of men of first class abilities and the necessary training and experience.

A general approval was given to the suggestion that such a scheme is necessary for the further progress of the Office in view of the public requirements as recently disclosed. The further consideration of the scheme was adjourned.

It was agreed that for the office of marine superintendent it was desirable to select from the members of the Office staff with the necessary experience and training.

It was also agreed to appoint two nautical assistants with experience afloat on the grade of professional assistants, the terms of appointment to be settled subsequently.

Retirements during War.—The following Minute with reference to superannuation during the war was approved :—

Members of the Staff who reach the age of retirement during the war will have their position as regards pension defined, and will be at liberty to take up their pensions if they desire to do so.

In case no other appointment is made to the posts which the retiring members of the Staff occupy, the Director will be authorised to continue the employment of the present holders beyond the normal age of retirement, and unless the Committee deem it necessary the new appointments will not take effect until the end of the war.

In the case of those retained in this manner full pay will be continued until six months after the quarter day next following the declaration of peace.

Income Tax Return.—It was agreed that in accordance with new instructions under the Finance Acts the payments made to observers at stations be returned as payments less than £130 per annum made to persons who are in receipt of salaries from other sources, and that a note be added to the effect that the payments are for "services" not for "service" and that the payee is the distributor and not the only receiver of the money.

Mr. E. L. Hawke.—It was agreed that the salary of Mr. E. L. Hawke, Temporary Professional Assistant, be increased to £140 as from 1st July, 1916 (Minute 559).

Mr. E. H. Nichols.—Reported that Mr. E. H. Nichols had joined the Royal Flying Corps as second mechanic, and it was agreed to confirm order No. 493 allowing his military pay to be made up to his civil pay of £140 as long as the grant of £164 per annum was made by the Scott Antarctic Fund (Minute 533).

New Appointments—Reported—the following order for confirmation :—

William George Palmer (born 18th May, 1902) to be office boy and boy messenger at 7*s.* 6*d.* per week, rising to 10*s.* a week after six months' approved service. To date from 29th May, 1916. (Order 487.)

Approved.

Age for Enlistment.—Reported—letter dated 12th June from the Civil Service Commissioners stating that after communication with the War Office the Treasury desire that permission for the enlistment of boys in the Civil Service should be refused until they have reached the age of 18.

592. Meteorological Section, R.E.—**Establishment.**—(Minute 573)—Reported—Letter 121/6424 (A.G. 7) of 3rd June from the War Office approving an increase in the establishment of the Meteorological Section, R.E., of two officers and four other ranks in addition to six non-commissioned officers approved by War Office letter 121/6424 (A.G. 7) of 18th March, 1916. The full addition of two officers and 10 N.C.O.'s asked for by M.O. letter of 22nd January, 1916 (Minute 573), is thus completed.

The following appointments have accordingly been made in the Meteorological Section dating from 17th June, 1916.

To be 2nd Lieutenants R.E. :—

D. Brunt, B.Sc., M.A., Professional Assistant (Minute 559).

T. Harris, M.A., A.R.C.Sc., Professional Assistant (Minute 568) (*London Gazette*, 26th June, 1916).

Lieutenant Brunt left for France on the 24th June, and Lieutenant Harris remains at the Central Office for the present.

Roll of Honour.—Reported—that the following officer and N.C.O.'s of the Meteorological Section were mentioned in the Commander-in-Chief's Dispatch of 30th April, 1916, for their distinguished conduct in the field :

Lieutenant A. E. M. Geddes, Sergeant R. Pyser, Corporal S. F. Witcombe.

593. OBSERVATORIES.—**Kew.**—*Site of Anemometer Hut* (Minute 581).—Reported—that in company with Major Lyons, and the Secretary of the Mid-Surrey Golf Club, the Director visited the Observatory on June 19th and agreed upon a suitable plot of ground to be taken over from the Golf Club to replace the site of the old anemometer hut. The site has been marked on an Ordnance Survey 25-inch map which has been forwarded to the Golf Club for signature.

Electrification of London and South Western Railway (Minute 569).—Submitted—draft letter to the Board of Trade inquiring whether the bargain already concluded between the Board and the Tramway Companies estops the Meteorological Committee from any remedy or further consideration in consequence of variation in the magnetic field at Kew Observatory.

It was agreed to consult Mr. Barstow on the matter.

Eskdalemuir.—*Professional Assistant.*—Reported—that on the recommendation of the Superintendent, Dr. J. R. Milne had been appointed Senior Professional Assistant temporarily from 15th June to 15th October, 1916, for duty at Eskdalemuir, on the usual terms, at a salary for the four months of £75.

Approved.

Inventory.—Reported—that the Superintendent had forwarded a report dated 18th May on an examination of the furniture, equipment, instruments, apparatus, tools, &c. being the property of the Committee at the Observatory, which shows that during the two years which have elapsed since an inventory was drawn up there is no serious case of shortage. The Superintendent suggests that articles which are broken, useless or cannot be found be struck off the inventory so as to bring it up to date.

Approved.

Motor Car.—With reference to resolution (3) of Minute 579 (Investments) stating that £265 be set aside pending a further report on the provision for conveyance and transport at Eskdalemuir, the Director reported correspondence with the Superintendent on the subject, 1709/C.E. 51, who recommended that a good second-hand car be obtained. In a further report the Superintendent gave a list of second hand cars (five British, one Belgian and one French) varying in price from £195 to £320, and recommended a Vinot-Gladiator car of French make of 20 h.p., price £200. This car has recently been given a thorough and complete overhaul, but the tyres are nearly half-worn. An expert's opinion of the car is very favourable. In reply to an inquiry as to whether the higher-priced cars are worth the extra cost, the Superintendent says that he is doubtful without a closer examination and trial, which he could arrange for.

It was agreed that, unless the Superintendent strongly recommends one of the other cars, the Committee approve the purchase of the Vinot-Gladiator car at a cost of £200, with an allowance for new tyres. It was agreed also to pay the expert's fees not exceeding £2 2*s*.

Reported further—that the Superintendent had proposed that the Regulations for the use of the motor car printed in Minute 404 be replaced by the following :—

ESKDALE OBSERVATORY.

Regulations for the use of Observatory Motor Car.

I. The motor car provided for the Observatory is placed in the charge and control of the Superintendent, who shall be personally responsible to the Director for its being carefully driven, properly cleaned, and maintained in thoroughly satisfactory condition.

II. Minor repairs and the cleaning of the engine internally shall be carried out by the Observatory mechanic, under the direction of the Superintendent. The car shall be kept clean externally by the Observatory handyman.

III. The car is primarily intended for use for official purposes, and these shall include—

(i) the conveyance of official visitors ;

(ii) the carriage of parcels to and from the railway, when other modes of dispatch and delivery are not available ;

(iii) journeys of the Superintendent or any member of the staff to and from the railway when on special duty or when on transfer to or from a post on the staff of the Observatory.

IV. When the car is not required for official purposes, the Superintendent shall be permitted to use it for private purposes to the extent of 1,000 miles annually, but in availing himself of this permission he shall be expected to meet the convenience of other members of the staff as far as

possible when they go on annual holiday or for any case of emergency. For any distance beyond 1,000 miles, or for any journey not covered by this rule, the Superintendent or any other member of the staff shall pay for the use of the car at the rate of sixpence per mile.

When the car is being used for official purposes, the Superintendent or any member of the staff may, if it be convenient, travel in the car without charge.

V. The Superintendent shall forward to the Director a quarterly report in such form as may be prescribed, showing the distances run, expenditure under different heads, and receipts for the use of the car.

Farnborough.—*Hut for Assistant.*—Reported—that Mr. R. A. W. Watt, Professional Assistant in connexion with the thunderstorm investigation at Farnborough, who was about to be married, had asked for the erection of a four-roomed wooden hut as married quarters at the site of the wireless enclosure. In support of the proposal he suggests that Mrs. Watt could keep a watch on the instrument at stated intervals, and that he himself could give additional attention to it in the evenings. The wireless enclosure is about 2 miles from the Branch Office, and is in telephonic communication with it.

Authority had accordingly been given to Captain Cave for the expenditure of a sum not exceeding £300 on the provision of a four-roomed bungalow on plans submitted by Messrs. Humphreys, of Knightsbridge, provided that the necessary authorities and easements were sanctioned by the War Office, which owns the land.

Approved.

Captain Cave reported that he has, with the Director's approval, signed a contract for the bungalow as set out in the plans, 50 feet long and 15 feet wide, height to eaves 8 feet, with the addition of some domestic fittings, for £305, to be delivered and erected within 14 days from 28th June. Water supply, artificial lighting and fees for local authorities are not included.

Anemometer.—Reported—correspondence with the Superintendent of the Royal Aircraft Factory with reference to the erection of an anemometer at the Branch Office, which has been required since the Office was opened, from which it appears that the proposal to instal a pressure-tube anemometer with pole 80 feet high, is still not approved in consequence of the danger to aeroplanes which would be caused by the pole. The Superintendent suggests that the Branch Office should make use of the anemometer provided by the Factory on Pyestock Chimney distant 2½ miles from the Branch Office.

As an anemometer is urgently required, and as this suggestion appears at the moment to be the best available, it is proposed to provide a hut at Pyestock Chimney to be in charge of an assistant who would be in telephonic communication with the Branch Office, and who would occupy his spare time with tabulating work.

Approved.

594. PUBLICATIONS.—**Monthly Meteorological Charts of the Mediterranean Basin.**—Reported—that a year's issues of this Chart are now available. It is proposed to edit and reissue the Charts for September and October which were the first to be prepared, and can now be considerably amplified. It is also proposed to prepare an introductory chart giving the names of the stations and a brief discussion.

Approved.

Réseau Mondial, 1911.—Read—letter from Professor H. H. Hildebrandsson, of Upsala, in appreciation of the volume *Réseau Mondial, 1911*, of which an advance copy had been forwarded to him (1179/P. 12).

Fire at Neill & Co., Ltd.—Reported—that a fire occurred at the works of Neill & Co., Ltd., Printers of Part III, Part IV, Section 2, and Part V. of the Year Book, and that the following work had been destroyed :—

Part III., Section 1, *Daily Readings 1916*, 185 printed-off copies of the issues for January to March.

Part III., Section 2, *Geophysical Journal*, 250 printed-off copies of the issues for January to December, 1914, also type for title-page and annual supplement, 1914.

Part IV., Section 2, *Hourly Values, Geophysical Section, 1914*, type for pp. 9–48.

Part V., *Réseau Mondial, 1911*, 500 printed-off copies of the complete volume.

Copy of all the destroyed matter was available in the Office and has been forwarded to the printers for reprinting, by arrangement with the Stationery Office.

Meteorological Office Circular.—Submitted—proof of an 8vo. 4 page circular dated 20th June, 1916, entitled *Meteorological Office Circular No.* 1. The immediate occasion for the preparation of the circular is the introduction of the Summer Time Act, which has necessitated a nominal change in the hour of observation at the climatological stations, and has introduced a considerable risk of confusion. Such a circular issued at intervals of a month would, however, be valuable at all times in promoting the solidarity of the association of the voluntary observers, both on land and sea.

It is accordingly proposed to ask the Stationery Office to print a similar circular every month, and to issue copies with the Monthly Weather Report and with the Monthly Meteorological Charts. A draft letter to the Stationery Office is submitted.

Approved.

Computer's Handbook.—Copies of the Introduction were laid on the table.

Rainfall for the London District.—A large chart showing monthly serial values of rainfall for the London district for 100 years was printed in June, 1913. The second chart showing daily, 5-daily, and monthly means of rainfall for the London district has now been printed, and is submitted.

Exchange of Publications.—Reported—that an exchange of publications had been arranged with the Belgian Colonial Ministry now at an address in London. The Ministry will forward the Agricultural Bulletin of the Belgian Congo in exchange for the Monthly Weather Report. (2004/L.)

Approved.

595. Directors' Report and Accounts.—**Wick.**—Reported—that on the transference of the telegraphic reporting station at Wick to the care of the coastguard, which took place in 1911 (Minute 301), it was arranged that the instruments be exposed in a field then let by the Admiralty to Mr. David Ronaldson, and that the Committee should pay Mr. Ronaldson £1 per annum in consideration of the facilities given. The Admiralty have now reported that Mr. Ronaldson's tenancy terminated on the 5th May, 1916, owing to the non-payment by him of rent due, and that the field has been relet from the 19th June, but the ground occupied by the meteorological instruments has not been included in the letting.

Reports of Work (Minute 586).—Reported—that the Reports of Work for the divisions of the Office and the Observatories for March, April, and May are ready for circulation as proposed.

Accounts.—Submitted—the following Statement of the Bank Account in the Cash Book:—

	£	s.	d.
Balance on 23rd May, 1916	5,600	18	8
Receipts from 24th May to 27th June, 1916	474	6	5
	6,075	5	1
Cheques drawn from 24th May to 27th June, 1916	3,649	19	4
Balance on 27th June, 1916	2,425	5	9

SEVENTY-THIRD MEETING.

South Kensington, S.W., 13th September, 1916.

PRESENT:

THE DIRECTOR, IN THE CHAIR.

CAPTAIN HARVEY.	MAJOR LYONS.
THE HYDROGRAPHER.	DR. SCHUSTER.

596. The Minutes (587–595) of the last Meeting (28th June, 1916), previously circulated, were taken as read, and confirmed.

597. CORRESPONDENCE.—**C. W. Scott.**—Read—letter of 2nd July from Mr. C. W. Scott thanking the Committee for their condolences on the death of Dr. Scott. (Minute 588.)

War Office.—*Instruction for Officers of R.F.C. at Training Centres.*—Read—the following correspondence :—

C.11/C.

Meteorological Office,
30th August, 1916.

SIR,

IN connexion with the supply of information about the weather for the military forces, the Meteorological Committee have under consideration a proposal for completing the organisation represented by the Meteorological Section R.E. by a Home Section to include those members of the staff of the Office, including its observatories, who are at present retained in their employment under certificates of exemption on the ground that their services are indispensable for the maintenance of the meteorological work required by the Naval and Military forces. The proposal is now under consideration by the War Office.

In this connexion the Committee have noted that the services of trained meteorologists may be required for lectures or instruction in the rudiments of weather-study at training centres of the Royal Flying Corps. At present this instruction is not organised ; it is, I believe, extemporised according to the wishes of the local Commanding Officers. Captain Cave, of the Meteorological Section R.E., gives occasional lectures at Farnborough and at Oxford, while at Reading Professor W. G. Duffield gives a course of instruction in meteorology to the officers in training there. There may be other centres where such instruction would be of value.

These courses of instruction, however they may originate, depend ultimately upon the organisation of this Office, since it is part of our business to collect and make available in the form of weather-maps, lantern-slides, diagrams, and so on, the material which is required for the purpose, and the work can be done more effectively if it is organised upon a recognised basis.

The choice of suitable material and the formation of a syllabus appropriate to the special circumstances is a matter of some difficulty and to make it easy for officers to know the kind of material available and the various forms in which it can be presented for the purposes of instruction we have prepared " The Weather Map," M.O. publication 225 i, as an introduction to the subject, and a " Glossary," M.O. 225 ii, of auxiliary information which an instructor can use to meet the special requirements of a particular class. Since the first issue of these publications a new edition has been prepared, in which a good deal of information specially appropriate for aircraft has been incorporated, so that it is especially suited for instruction at training centres.

If the proposal meets with your approval, the Committee would be prepared to arrange for the organisation of work of this kind at the request of and in consultation with any officer detailed by you, so that the requirements of the Commanding Officers who think it desirable and practicable to include some instruction in meteorology in the course of training, may be met.

In view of the great diversity of the previous education of flying officers, we think it best to approach the matter tentatively in this way rather than suggest a stereotyped course of instruction. Upon one point, however, we may offer a definite opinion : experience has made it clear that it is desirable that the meteorologist who gives instruction should hold an officer's commission, and association with the Meteorological Section R.E. would get over the difficulty that is found when a civilian has to take up the instruction of officers.

I am, &c.,
NAPIER SHAW.

The Director of Air Organisation,
War Office,
Adastral House,
London, E.C.

87/8444 (A.C.1.b.)—M.O. 2897.

War Office,
Adastral House,
Victoria Embankment, E.C.,
4th September, 1916.

SIR,

WITH reference to your letter, No. C.11/C., dated 30th ultimo, I am directed to say that we are in agreement with your proposal, and will be glad to take advantage of the services of trained meteorologists in connection with the training of officers of the Royal Flying Corps in the rudiments of weather-study, and should like to have periodical lectures at the various training centres. Applications for Instructors for the duty would be made direct to your Office by the Officer Commanding, Training Centre.

The Weather Map and Glossary referred to would be very useful and we should like to obtain a large number of copies for distribution to units of the Royal Flying Corps.

I am to add that, if you consider it necessary, a representative from this Directorate can meet you and discuss any details.

I am, &c.,
R. J. ARMES.
Major,
General Staff,
for Director of Air Organisation.

The Director,
Meteorological Office,
South Kensington,
London, S.W.

A preliminary syllabus has accordingly been drawn up, and after an interview with a representative of the Director of the Air Organisation, which took place at the Office on 7th September, the representative took away copies of the syllabus and arranged to report on the question of organising arrangements at Oxford and Reading.

Fog inquiry.—Reported—that following an urgent request received some weeks ago from the War Office for information as to the suitability or otherwise of various named localities in England as places for landing grounds for aeroplanes from the point of view of the absence or prevalence of fog, a request has now been received from Colonel Holt, War Office, for the assistance of a trained meteorologist in the matter, who would be expected to visit the localities and study the conditions at each place.

It is considered that two persons will be essential, and it is proposed to detail Major G. I. Taylor, professor of meteorology, for the work, with the assistance of Mr. E. V. Newnham, junior professional assistant at Benson Observatory.

Approved.

Stationery Office.—*Economy of Paper* (Minute 567).—Reported—the receipt from H.M. Stationery Office of circular letters dated 23rd March and 31st July, 1916, further urging the necessity of economy of paper.

The recommendations of the Stationery Office are being carried out as far as possible.

Carnegie Institution.—Read—letter dated 17th June, 1916, from Dr. L. A. Bauer, director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, in the course of which he mentions that the Institution contemplates the erection this year of a magnetic observatory in South-West Australia.

Dr. Schuster undertook to make inquiries about the matter.

598. ELEVENTH ANNUAL REPORT (Minute 590).—Submitted—paged revise of the report, corrected for signature.

It was agreed that a final revise be obtained and that the report be forwarded to the Treasury in the usual manner.

599. OFFICE STAFF FOR 1ST OCTOBER, 1916.—The following retirements are due to take effect from 30th September. They are postponed under Minute 591.

Marine Superintendent.
Principal Clerk, Marine Division.
Principal Draftsman, Marine Division.

Miss While resigns her appointment as clerk assistant in the Library Section.

There is a vacancy arising from the Storekeeper having joined Meteorological Section, R.E.

C. S. Herbert, boy clerk, has been called up but conditionally exempted under the Military Service Act.

The following applications have been received :—

Secretarial Section.—Miss Poole for promotion to Staff Assistant.

Marine Division.—Mr. Keeton for promotion on retirement of seniors.

Forecast Division.—Mr. Duffin, B.Sc. (late H.L.I.), for promotion to grade of senior professional assistant.

Mr. Newman (Probationer) for permission to join a technical department of the Forces.

Mr. Poulter (Probationer) for increase of pay to meet increased cost of living.

Instruments Division.—Mr. Bassett, Packers' Assistant, for an increase of pay because it is some time since he had the last.

Eskdale Observatory.—Mr. Skelton for permission to join a technical branch of the R.F.C. (withheld).

The following arrangements are provisionally recommended :—

Provision for superannuation allowances for Mr. Allingham and Mr. W. G. James to be made in accordance with the regulations.

The maximum of the salaries of superintendents of Divisions I., II., and III., to be £550, but no changes of salaries to be made from the existing rates until 1st April, 1917.

In view of the prospective vacancies in the Marine Division,

Mr. Whipple to be Superintendent of Statistics (with a maximum of £550), vice Major Gold, D.S.O., on active service, to date from [1st October] 1916, and to act as deputy superintendent of the Marine Division in Captain Hepworth's absence.

Mr. Corless, Director's Secretary, to be Superintendent of the Instruments Division (to retain for the time being the superintendence of the Press and certain other secretarial duties) to date from [1st October] 1916.

Mr. Keeton, Marine Division, to be staff assistant, on the retirement of Mr. Allingham on superannuation, to date from 1st October.

Mr. J. H. James, mechanical assistant, Instruments Division, to be staff assistant, on the retirement of Mr. W. G. James on superannuation, to date from 1st October, 1916.

Miss Poole to be staff assistant (supernumerary and temporary) in the Secretarial Section, in consideration of her special proficiency in languages, pending the reorganisation of the arrangements of the secretarial work.

Miss Chivers to be approved as probationer for that Section, Order 511.

In view of the absence of the Storekeeper, Miss D. G. Chambers to move to Room 22 and take charge of stores under the Secretarial Section with promotion to clerk assistant vice Miss While resigned.

A new appointment of probationer to be made for Accounts.

A further appointment of probationer to be made for the Library Division for November.

Forecast Division :—

Mr. Duffin, an increase of salary of £25.

Mr. Newman, Mr. Poulter and Mr. Bassett.—Applications to be considered when the decision of the War Office upon the proposal for a home unit (minute 600) is known.

There are absent on active service on civil service terms :—

E. Gold, Major, R.E., Superintendent.

F. Entwistle, Lieut., R.E., Professional Assistant.

A. H. R. Goldie, Lieut., R.E., Senior Professional Assistant.

C. D. Stewart, Lieut., R.E. (Special Companies), Professional Assistant.

E. L. Ardley, 2nd Lieut., Staff Clerk.

H. G. Harris, Sub.-Lieut., R.N.V.R., Clerk Computer.

A. E. Gendle, Lieut., R.N.V.R., Clerk Assistant.

M. T. Spence, Sub.-Lieut., R.N.V.R., Clerk Assistant.

On duty in England :—

E. H. Chapman, Lieut., R.E., Professional Assistant.

Approved.

The following Director's Order was also approved :—

Order 501, appointing Herbert James Bigelstone (born 24th September, 1899) boy clerk on the usual terms, as from 24th July. 1916, in place of C. V. Ockenden now corporal in the Meteorological Section, R.E.

600. METEOROLOGICAL SECTION, R.E.—**Proposal for a Home Unit.**—Read—the following letter to the War Office proposing the establishment of a "Home Unit" of the Meteorological Section, for reasons given.

C 11 (I.).

Meteorological Office,
South Kensington, S.W.
29th August, 1916.

SIR,

Proposal for a "Home Unit of the Meteorological Section, R.E."

THE Meteorological Committee desire the advice and assistance of the War Office with regard to members of their staff who have been exempted by certificate under the Military Service Acts as being indispensable for the maintenance of the Government Meteorological Service.

The Meteorological Service, forming part of an elaborate international organisation in which all civilised countries are associated, has many sides which may be summarised by the following enumeration.

(1) British climatology, (2) the climatology of the colonies and of the dominions and foreign countries, (3) weather statistics and library, (4) the meteorology of the sea, (5) the study of the upper air, (6) the daily weather service, (7) the supply of meteorological instruments to the ships of H.M. Navy, the meteorological sections of the Army, the mercantile marine, observatories and stations.

For the work of the first three sections, upon which the Committee rely for the supply of the records of past weather in reply to inquiries from all Government departments, municipal authorities and the general public, for the organisation and supervision of some 500 stations in the United Kingdom and a large number in various colonies and dependencies, for keeping up the exchange with the dominions and foreign countries, it has been possible to dispense with all the men of military age except two, viz., the Director's secretary, who also acts as superintendent of the division which is in charge of British climatological stations (in the absence of the superintendent who is Commandant of the Section at G.H.Q.), and the Librarian, who has also the supervision of the colonial stations and the arrangement of the statistics collected from foreign countries.

The remaining four divisions (concerned with Marine meteorology, the study of the Upper Air, the daily weather service and the supply of instruments) form together a special intelligence department for the Naval and Military Services. For marine meteorology which is concerned chiefly with statistics it has only been necessary to exempt one man. The other three sides form an organisation of a special character for the regular supply of information four times daily to the Services and for dealing with special inquiries.

The organisation comprises :—

1. The "Forecast Division" of the Office for the organisation of the service, the collection and distribution of the information.
2. The "Instruments Division" of the Office.
3. Seven principal observatories, four in England, two in Scotland, one in Ireland, viz. :—
   The Central Observatory at Kew,
   The Magnetic Observatory at Eskdalemuir, Dumfriesshire,
   The Meteorological Observatory at Aberdeen,
   The Western Observatory at Cahirciveen, Co. Kerry,
   The Weather Station of the Meteorological Office at Falmouth.
   The Observatory for the Study of the Upper Air at Benson, Oxon,
   The Branch Office for the R.F.C. at Farnborough.
4. Twenty-five other observing stations reporting daily by telegraph, which are distributed over the three kingdoms and the islands. For this service coast guard stations and lighthouses are used, supplemented by a few stations in charge of municipal authorities or private persons. The Office staff maintains the equipment, organises, supervises and inspects these stations.

For this organisation, including the supply of instruments, 22 men have been exempted of whom 12 are at the Meteorological Office, 3 at Kew Observatory, 2 at Eskdalemuir, 1 at Valencia, 1 at Aberdeen, 1 at Falmouth, 1 at Benson and 1 at Farnborough. Of these six have been at one time or other rejected for military service, and in some cases the selection of the men for their present posts, to replace men who have joined the forces, has been guided by that consideration, but the consideration does not now arise for reasons which are set out below.

The exemptions include—

The superintendent of the Forecast Division in charge of the whole service of reports and forecasts,

The superintendent of the Instruments Division in charge of the supply of instruments to the Navy and the Meteorological Services,

Five professional assistants with university degrees, special training and experience,

Fifteen technical assistants graded for Office purposes on the clerical staff.

With the progress of the war the work has become of a highly technical and confidential character. All the information is received in code and distributed by the Office to foreign countries, the Meteorological Sections at G.H.Q. in France and Salonika, the Navy and the Naval and Military Air Services in special secret codes supplied by the Admiralty or the War Office, which have to be carefully guarded.

In order to meet the demand for trained officers for the Field Services men of the necessary qualifications have been passed through the division for training, and have been changed frequently. They have had to rely largely upon the members of the technical staff, which has been permanent, for the rapid identification of the messages and the decoding of the telegrams. These number about 200 in and out, distributed all over the office day, which runs from 7 a.m. to 8.30 p.m. G.M.T., with special provision for 1 a.m. to 3 a.m.

The increase in the complexity of the work since the war began has already made it necessary to reorganise the division in order to prevent the work getting into confusion, and it is imperative that no changes beyond the unavoidable incidents of office life should occur.

Reports for the various departments of the Admiralty and War Office are prepared in the office four times daily, on the receipt of observations made at 1 a.m., 7 a.m., 1 p.m. and 6 p.m. G.M.T. The area covered by the observations now includes the whole of Europe, the Atlantic Islands and Northern Africa. The work must go on Sunday and week-day alike without fail. No relaxation of any kind is permissible, because any single occasion may turn out to be a critical occasion either as regards the weather or the Naval and Military operations.

Thus the group of men who carry on this service, with the staff of the Meteorological Sections at the Headquarters of the Expeditionary Forces, with whom the information is shared for the use of the Military Services, form a special intelligence department. The Office at home stands in the same relation to the Meteorological Sections in the field as the War Office does to the Army. The work of the officers at G.H.Q. depends upon that of the Office and Observatories at home, and the Meteorological Committee wish to submit that it is desirable that those who carry on the work at home should be incorporated in some way or other in the same unit with their colleagues in the field.

It is true that the same staff supplies a great deal of information to the Navy, Naval Air Services, Anti-Aircraft Services, and Home Forces, but the Navy had been accustomed to rely upon the office for information of this kind for very many years, and our relations with the Navy through the Hydrographic Office have become crystallised. Our relation with the Army is new, and the matter is complicated by the pressure which is exerted by the Military Service Acts to have the men's duties and responsibilities duly recognised and put in order.

Opportunities of various kinds occur for our men to find attractive billets in one or other of the technical services of the Navy or Army. Although they are exempted they are not under any military regulation to carry on their present duties, and they may at any time disorganise the service by accepting other work, or feel a sense of grievance at being refused permission to join the forces when permission has been given to other members of the office staff, and some of them with similar qualifications have received commissions in the R.N.A.S. But in view of the technical and confidential character of the work from the point of view of the Naval and Military Services, and the difficulty of replacing men of their technical experience while the work is being carried on continuously at high pressure, as it has been since the war began, and must be while it lasts, the Committee think that the Army Council will agree that it is desirable that the staff employed therein should be placed under military regulations.

I am, therefore, to suggest that the men so employed should be incorporated as a "Home Unit" of the Meteorological Section R.E.

The men in question group themselves in four ranks—

1. *Superintendents* who have almost reached the age limit for military service, and who for peculiar reasons, which I can set out if necessary, had better remain civilians.
2 and 3. *Senior and Junior Professional Assistants.*—University graduates, whose position generally correspond with those who have received Captains' and Lieutenants' commissions respectively, in the Meteorological Section R.E.
4. *Technical Staff*, whose position corresponds with that of men who have joined the Section as observers.

If this suggestion were carried out the men in the Office and Observatories would be on a footing to correspond with that of men who come to the Office for special training for billets in the Meteorological Section of the R.N.A.S.

I may mention that the Army has already taken for active service the two officers and ten non-commissioned officers who were authorised as an increase to the establishment of the Meteorological Section R.E. as a reserve to replace casualties, or meet increased demands. We ought to replenish that reserve to meet further contingencies; we have two professional assistants in training, one of whom was invalided out of the H.L.I., and a few boys approaching military age, who have the necessary technical knowledge, but with these exceptions we should have to take men from outside who are only to be found with difficulty.

The details of the proposal which I have outlined will require consideration, and if I have your approval I could take them up with Major Lyons in consultation with the A.A.G.R.E.

I am, &c.,

NAPIER SHAW.

The Secretary,
War Office,
Whitehall, S.W.

Approved.

Reserve of Observers.—Reported—minute 121/Drafts, &c./2207 (A.G. 7), dated 28th August, 1916, from the War Office, authorising the maintenance at the Meteorological Office of a further reserve of three observers, on account of the difficulty of finding suitable men at short notice. Major Lyons is taking steps to obtain the men.

Lieut. Harris.—Read—letter dated 15th July from 2nd Lieut. Harris (Minute 592), explaining that in consequence of new regulations of the East London College as to the payment of civil pay to members of their staff on military service, the allowance to him from the College of £2 a month will cease at the end of August. Lieut. Harris's military pay and allowances amount to £292 a year. He was graded as Senior Professional Assistant on the office staff, and since his commission has received no civil pay from the Office.

The Director undertook to communicate with Professor Lees on the subject.

Mediterranean.—Reported—letter 2696, of 15th August, from the War Office, forwarding, for information, copy of letter of 27th July, from the Commander-in-Chief, Egyptian Expeditionary Force, to the War Office, advising an increase of the staff of the Meteorological Office at Salonika, by two N.C.O.'s of the Meteorological Section R.E., as suggested by the Office on 11th July, and stating that the reports of the Meteorological Office have been of great value and utility to A.H.Q.

The following letter (2365/C.G.10) from the War Office, was received on 17th July, in reference to the same letter of 11th July, from the Meteorological Office :—

121/Mediterranean/1027. (M.O.1.) War Office,
15th July, 1916.

SIR,

WITH reference to your letter, C.G.10, dated 11th July, 1916, relative to the Meteorological Service in certain theatres of operations, I am commanded by the Army Council to say that all necessary measures should be taken to maintain the efficiency of the various sections during the coming winter season. Arrangements should, therefore, be made to send out the personnel to which reference is made to Salonika in due course.

The Army Council have received no special reports on this subject; should, however, any information of interest come to hand, steps will be taken to forward it to you.

A copy of this letter is being sent to General Officer Commander-in-Chief, Egypt, with a request that he will submit any observations or suggestions regarding the matters dealt with in it.

I am to add that the valuable services rendered by the Meteorological Sections are highly appreciated by the Army Council.

I am, &c.,
B. B. CUBITT.

The Director,
Meteorological Office,
South Kensington,
London, S.W.

E. T. Streets.—Read—letter of 26th August, from Rifleman E. T. Streets (Minute 574), now on active service, asking whether he could be transferred to the Meteorological Section R.E., in order to keep in touch with the Office.

It was agreed to refer the matter to the Meteorological Section.

601. OBSERVATORIES.—**Eskdale.**—*Motor Car.* (Minute 593.)—Reported—that after looking over the other cars, which were on sale, the Superintendent of the Observatory had arranged for the purchase of the Vinot-Gladiator car, on 3rd July, at a cost of £213 13*s.* 6*d.*, including two new tyres, and an E.U.K. starter.

Approved.

It was also agreed to approve the regulations for the use of the car as printed in Minute 593.

Petrol supply.—Reported—that the Petrol Committee having granted the Observatory a license for six gallons of petrol per month for three months, the Superintendent had represented that his minimum requirements are 12 gallons per month, and that, after correspondence with Mr. Barstow, the representation had been forwarded on 21st August to H.M. Treasury for transmission to the Petrol Committee, with a letter to the effect that the Observatory is wholly employed on Government work, and that its remote position renders the use of a motor car essential.

Valencia.—Reported—that Mr. R. G. K. Lempfert, Superintendent of the Forecast Division, had presented to the Office the following books :—

Nature, bound volumes, 70 to 92.
Reports of the British Association, 1903 to 1915.

Journal of the Scottish Meteorological Society, 1906—1912.

Annual Report of the Fernley Observatory, Southport, 1903—1905 and 1907—1913.

Reports of the Observatory Department of the National Physical Laboratory, 1904—1905, 1907—1909.

The volumes have been accepted with thanks, and it is proposed to forward them to Valencia Observatory.

Approved.

602. PUBLICATIONS.—**Presentation.**—Reported—that copies of Geophysical Memoirs, Nos. 1 to 11, have been presented to the Naval Academy, Petrograd.

Approved.

New publications.—The following pamphlets and new publications have been signed for press :—

Estimation of height from readings of an altimeter.

The Tail Method of determining the motion of Pilot Balloons.

Instructions for the use of Lightning Recorders.

The *Weather Map* and *Glossary* (2nd Edition) are in proof, and proof has been received of the text of the *Barometer Manual for the use of Seamen.* (8th Edition.)

Reported—that the Stationery Office had notified (2929/0·123) that the stock of official publication 123, *Meteorological Charts of the Southern Ocean between Cape of Good Hope and New Zealand*, of which a second edition on a reduced scale was printed in 1907, was reduced to 8 copies, and that 50 copies are urgently required to complete a demand for the Admiralty. 42 copies had accordingly been supplied from the Office, leaving in hand only 5 copies.

It is proposed to re-issue the charts in the same form as the second edition.

Approved.

603. DIRECTOR'S REPORT AND ACCOUNTS.—**Reports of Work.**—Reported—that Reports of Work for the divisions of the Office, and for the observatories, for March to July, 1916, had been prepared and circulated (Minute 586).

Accounts.—Submitted—the following Statement of the Bank Account in the Cash Book :—

	£	*s.*	*d.*
Balance on 27th June, 1916	2,425	5	9
Receipts from 28th June to 12th September, 1916	6,987	13	9
	9,412	19	6
Cheques drawn from 28th June to 12th September, 1916	8,771	9	9
Balance on 12th September, 1916	£641	9	9

Submitted—The following Statement of Accounts for the Quarter ending 30th June, 1916, prepared for audit by the Comptroller and Auditor-General :—

RECEIPTS.						PAYMENTS.					
1915. £ s. d.		£ s. d.	1916. £ s. d.			1915. £ s. d.		£ s. d.	1916. £ s. d.		
861 16 6	Balance from year 1915–16	—	2,208 15 5			250 0 0	Director	—	250 0 0		
5,625 0 0	Parliamentary vote .	—	5,625 0 0				OFFICE SALARIES (including Insurance) :				
						2,188 3 10	Monthly	2,362 6 5			
	DEPARTMENTAL EXPENSES REPAID :					252 14 5	Weekly	359 18 10			
2 9 11	Forecasts, &c. ...	14 6							2,722 5 3		
	Marine, Statistical, and Administrative						EXPENSES OF OFFICE :				
33 1 8		16 19 5				171 1 2	Rent, Heating, and Lighting	171 10 9			
19 17 5	Instruments ...	6 14 10					Furniture and Equipment				
						8 14 9		44 4 9			
			24 8 9			10 14 3	Library	9 14 9			
						56 3 6	Insurances, Repairs...	3 15 0			
	INCIDENTAL EXPENSES REPAID :						Incidental Expenses and Consumable Stores				
33 11 11	D.W. Report ..	20 6 1				55 9 10		62 14 8			
16 12 10	Divisional... ...	20 1 4				12 1 8	Advertising Account...	1 17 6			
	Advertising Account								293 17 5		
2 0 11		1 0 2					POST OFFICE :				
			41 7 7			165 4 7	Postage	183 1 11			
						77 11 3	Telephones	90 15 8			
22 3 3	STATIONERY OFFICE	—	9 4 3			475 14 1	Telegrams	718 9 11			
									992 7 6		
						88 17 5	STATIONERY OFFICE...	—	70 1 5		
38 17 8	TELEGRAPH CHARGES REPAID	—	89 5 7			—	TRAVELLING EXPENSES	—	11 10 11		
							SUPERANNUATION :				
1 3 8	TELEPHONE CHARGES REPAID	—	4 0			106 5 0	Pensions not chargeable on Fund ...	92 18 4			
						56 18 10	Pensions chargeable on Fund	68 18 0			
16 0 0	INSPECTIONS ...	—	—			196 17 6	Annuities	140 12 6			
						167 15 0	Contribution to fund	—			
	INSTRUMENTS :								302 8 10		
—	Royal Navy ...	10 5 6					COST OF INSTRUMENTS:				
	Mercantile Marine,					458 4 8	Royal Navy	950 17 5			
292 15 7	Stations, &c. ...	284 15 4				75 0 3	For Office use ...	68 19 2			
			295 0 10			319 15 8	Other Commissions ...	1,327 18 7			
									2,347 15 2		
	SUPERANNUATION ACCOUNT :						*OBSERVATORIES, BRANCHES, AND STATIONS :				
200 0 2	Annuities	151 17 6									
	Interest on Investments					543 2 10	Kew	602 15 11			
10 2		15 19 5				396 1 9	Eskdale	321 14 0			
			167 16 11			145 6 4	Valencia	177 9 8			
	*OBSERVATORIES, BRANCHES, AND STATIONS :					134 11 9	Farnborough ...	78 1 10			
77 9 1	Kew	283 8 11				50 12 7	Falmouth	71 0 11			
9 1 2	Eskdale	506 10 3				116 14 9	Benson	107 13 8			
8 15 0	Valencia	8 15 0				98 10 6	Edinburgh	99 6 6			
257 9 0	Farnborough ...	256 13 9				295 8 9	Miscellaneous ...	293 7 2			
1 11 4	Falmouth... ...	4 14 7							1,751 9 8		
—	Benson	10 0 0					BALANCE :				
39 9 6	Miscellaneous ...	26 17 9				489 19 11	Cash at Bank ...	748 8 2			
			1,097 0 3			75 4 8	,, at Office ...	67 19 3			
	LECTURES AND EXPERIMENTS ...					30 0 0	Advance for Inspections	—			
9 4 9		—	—						816 7 5		
£7,569 1 6			£9,558 3 7			£7,569 1 6			£9,558 3 7		

* For details, see separate statement.

Statement of Assets and Liabilities at 30th June, 1916.

LIABILITIES.						ASSETS.					
£ s. d.		£ s. d.				£ s. d.		£ s. d.			
1,912 1 6	To sundry creditors	3,444 1 5				565 4 7	By cash at Bank and at Office ...	816 7 5			
—	,, superannuation	64 8 6				9 14 2	,, salaries reserved (premiums) ...	23 18 2			
928 5 4	,, balance	2,017 5 1				374 4 6	,, M.O. instruments in stock ...	839 19 2			
						1,093 18 11	,, sundry debtors	1,002 14 6			
						797 4 8	,, Admiralty	2,842 15 9			
£2,840 6 10			£5,525 15 0			£2,840 6 10			£5,525 15 0		

NOTE.—On 30th June the amount of Government securities held for the provision of Superannuation Annuities was £26 14*s.* 2*d.* 2½ per cent. Consols, and £702 10*s.* 2*d.* 4½ per cent. War Loan.

Observatories.—Statement of Accounts for the Quarter ended 30th June, 1916 :—

KEW.

1915. £ s. d.	Receipts.	£ s. d.	1916. £ s. d.
41 0 0	Subvention, Scott Antarctic Fund	41 0 0	
—	Gassiot Trust	194 5 2	
			235 5 2
2 4 7	Expenses refunded locally ...		48 3 9
30 11 6	Tests and Commissions		—
3 13 0	Cost of books and forms refunded		—
465 13 9	Balance		319 7 0
£543 2 10			£602 15 11

1915. £ s. d.	Payments.	£ s. d.	1916. £ s. d.
456 6 7	Salaries, Scheduled ...	455 8 9	
6 16 2	Sunday and holiday duty	13 2 1	
			468 10 10
3 13 9	Cost of forms, &c.		13 0 6
18 18 2	Rent, Rates, Taxes, Repairs and Insurance		49 9 7
30 12 10	Fuel and lighting		23 8 1
12 5	Equipment and instruments ...		20 10 4
7 10 5	Consumable stores		5 5 4
4 2 0	Incidental expenses...		7 2 0
1 11 6	Books, &c.		2 2 2
12 17 7	Postage, telephones and telegrams		13 2 8
1 5	Travelling expenses...		4 5
£543 2 10			£602 15 11

ESKDALE.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
—	Subvention, Royal Society ...	500 0 0	259 8 4	Salaries, Scheduled	225 19 3
9 1 2	Expenses refunded locally ...	6 10 3	14 4 0	Cost of forms, &c.	21 18 3
387 0 7	Balance	—	26 2 5	Rent, Rates, Taxes, Repairs and Insurance	3 1 6
			45 0 0	Fuel and lighting	6 7 6
			6 4 5	Equipment and instruments ...	13 9 2
			6 2 0	Consumable stores	5 19 11
			2 9 5	Incidental expenses...	3 7 6
			2 11 10	Books, &c.	2 2 9
			26 12 2	Postage, telephones and telegrams	27 7 10
			7 7 2	Travelling and motor car expenses	12 0 4
			—	Balance	184 16 3
£396 1 9		£506 10 3	£396 1 9		£506 10 3

VALENCIA.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
—	Subventions (Rosse Fund) ...	—	115 18 8	Salaries, Scheduled...	127 16 2
8 15 0	Expenses refunded locally ...	8 15 0	—	Cost of forms	—
136 11 4	Balance	168 14 8	1 15 4	Rent, Rates, Taxes, Repairs and Insurance	26 9 10
			4 0 0	Fuel and lighting	5 2 2
			8 2 11	Equipment and instruments ...	2 5 0
			12 8	Consumable stores	11 4
			—	Incidental expenses	8 11
			—	Books, &c.	1 8 0
			13 6 6	Postage, telephones and telegrams	13 8 3
			1 10 3	Travelling expenses	—
£145 6 4		£177 9 8	£145 6 4		£177 9 8

FARNBOROUGH BRANCH OFFICE.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
250 0 0	Subvention (Advisory Committee for Aeronautics)	250 0 0	80 7 3	Salaries, Scheduled	8 5 9
7 9 0	Expenses refunded (War Office)..	6 13 9	—	Cost of forms	—
			7 9	Rent, Rates, Taxes, Repairs and Insurance	—
			9 1	Equipment and instruments ...	34 9 5
			3 4 1	Consumable stores	7 7 8
			—	Incidental expenses	18 8
			2 15 0	Books, &c.	1 8 0
			23 18 2	Postage, telephones and telegrams	25 12 4
			23 10 5	Travelling and motor car expenses	—
			122 17 3	Balance	178 11 11
£257 9 0		£256 13 9	£257 9 0		£256 13 9

FALMOUTH WEATHER STATION.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
1 11 4	Expenses refunded locally ...	4 14 7	15 0 0	R. Cornwall Polytechnic Society ...	15 0 0
49 1 3	Balance	66 6 4	18 15 0	Salaries, Scheduled	29 5 6
			2 6	,, additional	—
			6	Rent, Rates, Taxes, Repairs and Insurance	—
			—	Equipment and instruments ...	1 7 2
			10 4	Consumable stores	3 11
			—	Incidental expenses	1 11
			12 2 0	Postage, telephones and telegrams	18 13 8
			4 2 3	Travelling expenses	6 8 9
£50 12 7		£71 0 11	£50 12 7		£71 0 11

BENSON.

1915. Receipts.		1916.	1915. Payments.		1916.
£ s. d.		£ s. d.	£ s. d.		£ s. d.
—	Expenses refunded locally ...	10 0 0	100 8 0	Salaries, Scheduled...	85 3 3
116 14 9	Balance	97 13 8	2 0	Overtime, &c.	—
			—	Cost of forms, &c.	—
			—	Rent, Rates, Taxes, Repairs and Insurance	—
			0 13 0	Fuel and Lighting	1 0 0
			—	Equipment and instruments ...	0 5 0
			6 15 6	Consumable stores	5 5 11
			1 3 0	Incidental expenses	1 9 6
			—	Books, &c.	—
			7 13 3	Postage, telephones and telegrams	12 9 0
			—	Travelling expenses	2 1 0
£116 14 9		£107 13 8	£116 14 9		£107 13 8

METEOROLOGICAL OFFICE, EDINBURGH.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
98 10 6	Balance	99 6 6	87 10 0	Subvention	87 10 0
			11 0 6	Travelling expenses	11 16 6
£98 10 6		£99 6 6	£98 10 6		£99 6 6

MISCELLANEOUS STATIONS.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
39 9 6	Cost of forms refunded	26 17 9	86 2 6	Subventions, Aberdeen, Armagh 86 2 6	
255 19 3	Balance	266 9 5	—	British Rainfall Organisation ... —	
					86 2 6
			135 12 0	Salaries of Observers (32)	160 12 0
			—	Overtime	—
			41 16 0	Cost of forms, &c.	—
			5 5 8	Rent, Rates, Taxes, Repairs and Insurance	2 12 6
			—	Equipment and instruments ...	6 18 9
			—	Consumable stores	19 6
			14 8 7	Agents' fees, &c.	11 2 1
			2 11 6	Books, &c.	1 5 0
			9 12 6	Postage, telephones and telegrams	23 14 10
£295 8 9		£293 7 2	£295 8 9		£293 7 2

METEOROLOGICAL FIELD SERVICE.

FRANCE.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
—	War Office	—	—	Salaries:		
—	Balance	102 10 8	—	Major E. Gold	—	
			—	Lieut. A. H. R. Goldie	3 10 10	
			—	Sergt. R. Pyser ...	6 18 11	
			—	Corpl. E. L. Clinch ...	5 17 0	
			—	„ A. G. Goad ...	11 13 4	
						28 0 1
			—	Salaries: Overtime		—
				Incidental Expenses:		
			—	Postage	4 14 11	
			—	Telegrams	—	
			—	Printed books ...	—	
			—	Miscellaneous ...	9 0	
						5 3 11
			—	Instruments		69 6 8
—		£102 10 8	—			£102 10 8

DARDANELLES.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
—	Admiralty	79 11 1	—	Salaries:		
—	War Office	180 18 3	—	Corpl. C. V. Ockenden		—
—	Balance	192 10 6	—	Salaries: Overtime		14 18 9
				Incidental Expenses:		
			—	Postage	1 13 8	
			—	Telegrams	244 0 10	
			—	Printed books ...	—	
			—	Miscellaneous ...	1 11 8	
						247 6 2
			—	Instruments		190 14 11
—		£452 19 10	—			£452 19 10

SEVENTY-FOURTH MEETING.

South Kensington, S.W., 25th October, 1916.

PRESENT :

THE DIRECTOR, IN THE CHAIR.

CAPTAIN HARVEY.	MAJOR LYONS.
THE HYDROGRAPHER.	DR. SCHUSTER.

604. The Minutes (596–603) of the last Meeting (13th September, 1916), previously circulated, were taken as read and confirmed.

With reference to Minute 597, Dr. Schuster reported that he had been in correspondence with the High Commissioner for Australia on the subject of the Magnetic Observatory which the Carnegie Institution proposed to erect in South-Western Australia, and that nothing was known of the proposal in London. An official enquiry had been sent to Australia.

605. CORRESPONDENCE.—**War Office.**—*Proposal for Home Unit* (Minute 600).—Read—the following letter (3066/C.11(I)) from the War Office in reply to the letter printed in Minute 600 :—

20/Gen. No./4309. (M.S.1.)

War Office,
21st September, 1916.

SIR,

I AM commanded by the Army Council to acknowledge receipt of your letter of the 29th August, No. C.11(1), and to inform you in reply that the proposals put forward have received most careful consideration, but it is regretted that they cannot be sanctioned.

It is fully recognised that the work performed by many members of your staff is very closely allied to military service and is essential for the needs of the Army.

The same may, however, be said as regards other civilian occupations, and the question of giving military status in such cases has been considered by the Army Council, who have decided that the inclusion of any individuals in the Army must be limited to those whose duties make it absolutely necessary that they should receive commissions, or be enlisted as the case may be.

I am, &c.,
B. B. CUBITT.

The Director,
Meteorological Office,
South Kensington, S.W.

Fog Inquiry (Minute 597).—Reported—that 40 ship-board screens with wet and dry bulb thermometers had been supplied to Major G. I. Taylor for the Fog Inquiry, and that a further 40 were to be supplied as soon as possible.

Reported further—that Mr. Newnham had been withdrawn from Benson for the purpose of the inquiry and had been replaced temporarily by Mr. E. G. Bilham, professional assistant at Kew Observatory, leaving the Observatory without a professional assistant.

In view of the increasing importance of information as to the temperature in the upper air, it was agreed that the services of H. W. Baker, formerly mechanical assistant at Benson, now engaged at the Royal Aircraft Factory, be obtained from the factory if possible for duty at Benson. In that case Mr. Bilham would return to Kew.

Post Office.—*Account for unpaid Postal Matter.*—Read—letter 3448/T.04 of 24th October from the Post Office, suggesting that in order to simplify the postal account, postage of unpaid letters sent and received should only be assessed and recorded during one week in each quarter of the year, and that the amount payable for the year should be calculated on the information thus obtained. The weeks would be selected by the Post Office in consultation with the Meteorological Office, in order to obtain a fair average.

It was agreed to assent to the proposal.

Dr. Scott's Legacy to the Royal Society.—The Director reported—that Dr. Scott had bequeathed to the Royal Society as many of the books from his library as they required,

and that the remainder were to be sold. At the request of the Society he had made and forwarded a list of the books which might be acceptable.

It transpired that there were only two books which were desired, namely, Hann's *Lehrbuch der Meteorologie*, 2nd edition, and Dove's *Meteorologische Beiträge*, 1857–1869. The remainder of the library was sold at auction on 20th October, but by arrangement with the Surveyors some of the books were kept back from the sale with a view to their being acquired for Valencia. A number of others, including a set of volumes of *Nature*, copies of the *Quarterly Journal of the Meteorological Society*, and copies of *Meteorologische Zeitschrift*, which were required to complete sets, and had been included in the sale through inadvertence, were purchased at the sale at a cost of 22*s.* 6*d.*

John Morton & Co.—*Glasgow Agency.*—Read—letter 3354/114 of 16th October from John Morton & Co., a new firm of Opticians and Nautical Instrument Makers, of Glasgow, suggesting that they should take over the Glasgow Agency from Messrs. D. MacGregor & Co., on the ground that Mr. John Morton has had the sole working of the agency for D. MacGregor & Co. for the last 25 years.

Read also—a report by Captain Hepworth on the subject.

Captain Harvey reported that after the War it would probably be possible to arrange for the work of the agency to be carried out by a representative of the Board of Trade.

It was agreed to take no action.

606. Office Staff.—**Roll of Honour.** — Reported — that information had been received that Private G. J. Barker, 13th Battalion, London Regiment, lately Boy Clerk in the Statistical Division, was killed by a shell in France on 9th October.

War Bonus.—Read—application 3325/W.12 from the cleaners for a war bonus, in which it is stated that other women in similar positions in Government Offices have been receiving a bonus for some time.

Read also—letter 3335/C.11(I) from Mr. W. H. Parsons, Senior Office Keeper, asking that the annual amount, £10, of deferred pay which is deducted from his salary to provide for an endowment assurance, should be paid to him in view of the high cost of living, and that arrangements be made for a pension instead of an endowment assurance in his case.

Read also—report from the "Times" of a reply to a question in the House of Commons, explaining the practice in the Civil Service.

Submitted—the following draft order on the subject :—

525. *War Bonus.*—In view of the fact that the Treasury has sanctioned temporary increases of pay in the Civil Service on account of the increased cost of living, except in those cases in which employment is already at special rates on account of the War, the following temporary increases of pay, based generally upon the rates allowed in the Civil Service, have been authorised to date from 1st October, 1916, until rescinded by order.

Men :—Clerks and Clerk Assistants receiving more than £110 per annum, at the rate of £7 16*s.* a year.

Clerk Assistants receiving £110 per annum or less, and Clerk Computers, at the rate of £10 8*s* a year.

Women in the corresponding grades one-half of the increments mentioned above.

Probationers, Boy and Girl Clerks, Boy Messengers, 2*s.* a week.

Cleaners, 1*s.* a week.

Other grades of the clerical staff whose pay, with allowances, exceeds £110 a year and is not more than £150 a year, 3*s.* a week ; those whose pay, with allowances, is not more than £110 a year, 4*s.* a week.

Unless otherwise ordered, employment which commenced after 1st October, 1915, will be deemed to be employment on special war terms, which by the Treasury ruling is not eligible for an increase on account of increased cost of living.

Approved.

New Appointment.—Reported—that Mr. J. F. Duffin, Junior Professional Assistant, who had been invalided out of the Highland Light Infantry, had received instructions to report himself to the Army Medical Officer in November, and that an application for employment had been received from Mr. F. A. Ward, B.Sc., invalided out of the Army on 4th August. Mr. Ward is now a school teacher in Ealing, and could arrange to come at a month's notice.

The appointment of Mr. Ward as Junior Professional Assistant at £150 a year was approved, and the Director was authorised to arrange the commencement of his service.

607. PUBLICATIONS.—**Programme of Publications.**—Submitted—the following :—

PROGRAMME OF PUBLICATIONS FOR 1917–18.

Periodical:

Daily Weather Report (1918) (550) (900 to 950 is the normal number).
Monthly Meteorological Charts of the Atlantic Ocean (1918) (600 + 200 for Admiralty + 275).
Monthly Meteorological Charts of the Indian Ocean (1918) (350 + 200).
British Meteorological and Magnetic Year Book :
Part I.—Weekly Weather Report (1918) (375 + 75). (The daily weather maps have not been printed since August, 1914. Each map when it appears should occupy a full 4to page.)
Appendices I. and II., as before.
Part II.—Monthly Weather Report (1918). Monthly Summaries (600 + 100 + 700 for Royal Meteorological Society + 125 for Scottish Meteorological Society + 25 each of two plates).
Annual Summary, including wind summary for the year (700 + 100 + 700 for Royal Meteorological Society + 125 for Scottish Meteorological Society + 25 each of two plates).
Part III., Section I.—Daily Readings at Stations of the First and Second Orders with Annual Review (1918) (250).
Section 2.—Geophysical Journal, with Annual Review of the Investigation of the Upper Air (1917) (400).
Part IV.—Hourly Values from Autographic Records (1916) (400).
Part V.—Réseau Mondial (1914) (500).
Observer's Handbook, 1917 edition (100 + 400).
[Summary of Maritime Weather Signals at present in use in the various countries of the globe (1917 edition) (125).]
Calendar, with Notes and Diary for the use of observers, for 1918 (500).

Occasional:

Handbook of Meteorology for the use of the Naval and Military Services. (Royal 8vo.)
Meteorological Charts of the Southern Ocean between the Cape of Good Hope and New Zealand. The 1907 edition is reported to be out of print.
Other occasional publications will be guided by the requirements of the Naval and Military Services. They may take the form of the following :—
Geophysical Memoirs. Manuscript of several is practically ready, but none have been put forward for printing since October, 1914. (Royal 4to.)
Computer's Handbook (500). Further portions are in preparation. (Royal 8vo.)
Tabulator's Handbook (500). Manuscript is in active preparation. (Royal 8vo.)
Normals of Temperature, Rainfall and Sunshine for 1881–1915. (Royal 8vo.)
Twelve Monthly Charts of the South Atlantic Ocean (M.O. press).
Atlas of Tropical Hurricanes (500 + ?).
Memoir on the distribution of ice (if not already completed).
[Climatological Atlas of the British Isles.]
[Monthly Charts of Mean Temperature of the Atlantic, South of latitude 50° N., in co-operation with the Danish Institute.]

Note.—The dates appended to the titles of the periodical publications are the dates of the latest volume of the series for which authority is required.

Publication of the works enclosed in square brackets is not expected to occur until after the war.

New Publications.—Copies of the Computer's Handbook, Section II., (1), pp. II. 23–II. 28, and of "Instructions in the use of Lightning Recorders," were placed on the table.

608. PROGRAMME OF WORK FOR 1917.—It is not proposed to draw up a formal programme of work. The position is similar to that which obtained last year. (*See* Minute 554.)

609. ESTIMATES FOR 1917–18.—Submitted—the following materials for estimates for the year 1917–18 :—

METEOROLOGICAL OFFICE.

PROVISIONAL ESTIMATE OF CHARGES UPON THE GRANT FOR 1917–18. SCHEDULE I.

Service.	Spent 1915–16.	Voted 1916–17.	Spent Half-year.	Proposed 1917–18.	
	£	£	£	£	£
Salaries (*see* Schedule II.) (139 posts) :—					
Office (95 posts)	15,211	12,259	5,845	13,353	
Observatories (34 posts)		4,426	1,895	4,079	
Insurance		45	26	45	
Meteorological Field Service (10 posts) ...		1,958	71	1,670	
		18,688		19,147	
Less Army Pay and deductions on account of members of the Staff on War Service.	—	3,224	—	2,543	16,604
		15,464			
Office Expenses :					
Rent, Heating, and Lighting	685	700	343	700	700
Furniture and Equipment	230	100	82	100	
Library	21	50	14	50	
Insurances and Repairs	98	120	4	120	
Incidental Expenses and Consumable Stores...	234	250	129	250	520
Post Office Charges :					
Postage	665	750	373	750	750
Telephones	88	100	92	100	100
Telegrams from inland stations	797	1,000	409	900	
„ wireless messages	—	10	—	—	
„ from abroad	553	525	729	1,500	
„ sent abroad	2	30	—	—	
„ Gale Warnings	246	109	22	—	
„ Harvest Forecasts	34	50	—	50	
„ sundry messages, &c.	33	60	9	60	
Allowances to Clerks	*214	220	†44	200	2,710
Stationery Office (S.O.P.)	89	60	70	100	
Advertising Account	18	20	4	20	120
Travelling Expenses	144	250	104	250	250
Superannuation :					
Annuities	698	712	281	562	
Pensions not chargeable on Fund	425	425	99	25	
„ chargeable on Fund	264	516	138	276	
Contribution to Fund	665	234	—	750	1,613
Purchase of Instruments :					
Royal Navy	2,684	1,000	2,012	4,000	
For Office use	171	450	2,883	450	
Other commissions	1,675	1,000		4,000	8,450
M.O. Observatories (excluding salaries) (*see* Schedule III.) :					
Kew	338	422	212	422	
Eskdale	493	510	‡172	520	
Valencia	146	225	63	168	
Falmouth	94	173	56	170	
Farnborough	181	250	§80	205	
Benson	44	488	60	478	1,963
Auxiliary Observatories and Stations :					
Subventions : Aberdeen...	295	295	147	295	
Armagh	50	50	25	50	345
Salaries of Observers : Anemograph stations...	38	670	7	670	
Telegraphic stations ...	658		274		
Climatological stations	4	50	25	100	770
Incidental Expenses : Rents, Rates, Taxes, &c.	12	15	4	10	
Cost of Forms, &c. ...	122	160	66	150	
Agents' Fees	51	90	20	60	
Labels	7	10	3	10	
Postage, telephones, and telegrams.	23	30	24	50	280
British Rainfall Organization	55	55	13	55	55
Edinburgh Office	373	375	187	375	375
Lectures and Experiments :					
Schuster Readership	—	—	—	—	
Lectures, &c.	—	—	—	—	
Contribution to International Publication ...	—	—	—	—	
Total	28,928	28,073	17,116	—	35,605

* 5 quarterly payments.
‡ Exclusive of £216 paid for new Motor Car.
† 1 quarter only.
§ Exclusive of £305 paid for new Bungalow.

APPROPRIATIONS IN AID. SCHEDULE I.—*continued.*

—	Realised 1915–16.	Voted 1916–17.	Realised Half-Year.	Proposed 1917–18.	
	£	£	£	£	£
Subventions for observatories:					
Advisory Committee for Aeronautics	250	250	250	250	250
Royal Society	1,399	1,462	694	1,400	1,400
War Office	24	21	7	65	65
Antarctic Fund	164	164	41	164	164
Expenses refunded:					
M.O. observatories	120	219	96	206	206
Auxiliary observatories and stations	134	100	49	100	100
M.O. departmental:					
Administration, &c.	102	100	29	60	
Forecasts	5	—	2	5	
Instruments	163	150	35	150	215
M.O. incidental:					
Administration, &c.	28	40	43	80	
Forecasts and Daily Report	127	100	37	80	
Instruments	23	25	3	10	170
Stationery Office Account	70	60	22	100	
Advertising Account	6	10	2	20	120
M.O. telegraphic expenses:					
Home	36	30	19	50	
Foreign	142	—	124	1,100	1,150
M.O. telephone charges	9	—	1	2	2
Inspections	168	100	76	100	100
Instruments (Royal Navy)	2,687	1,000	2,011	4,000	
„ (other sources)	1,346	1,000	370	4,000	8,000
Superannuation annuities	746	712	293	562	
Invested fund—interest	17	30	16	30	592
Lectures and experiments	—	—	—	—	—
Total Appropriation in Aid	7,775	5,573	4,220	—	12,534

	£	
Expenditure ...	35,605	
Appropriations ...	12,534	
	£23,071	Grant £22,500

*** The authorised expenditure was subsequently increased (Minute 615) by the following items :—War Bonus £300, Additional Clerk, Instruments Division, £150, Additional Staff, Forecast Division, £300, making altogether a sum of £1,321 in excess of the fixed grant. The sum was reduced to the amount of the grant by the following reductions :—

	£
Allowance for vacancies—Secretary	350
Sub-editor	150
Allowances reduced :—	
Instruments for offices	150
Superannuation (additional contribution)	276
Travelling expenses	50
Telegrams from abroad	45
Observatories—Benson (Reserve Fund)	300
	£1,321

STATEMENT OF ESTIMATED CHARGES UPON THE GRANT FOR 1917–18.

SALARIES, including normal increases: OFFICE AND OBSERVATORIES.

SCHEDULE II.

Establishment.	—	Meteorological Field Service.	Administration and Library.	I. Marine Division.	II. Forecast Division.	III. Statistical Division.	IV. Instruments Division.	Kew.	Eskdale.	Valencia.	Falmouth.	Farnborough.	Benson.	Totals. 1917–18.	£
	Director	—	—	—	—	—	—	—	—	—	—	—	—	—	1,000
	Secretary	—	1	—	—	—	—	—	—	—	—	—	—	1	350
	Professional Staff:														
10	Superintendents, Commandant, and Meteorologists-in-Charge.	1+ [1]	—	1	1	1+ [1]	1	1	1	1	—	1	1	12	3,972
7	Senior Professional Assistants (225–330)	2	1	—	2[2]	—	—	—	—	—	—	—	—	7	1,270
5	Junior Professional Assistants (125–200)	2	1	—	3+ [2]	—	—	2	—	—	—	—	1	11	1,450
1	Graduate Assistants (60–100)	—	1†	—	—	—	—	—	—	—	—	—	—	1	100
	Classified Clerical and Technical Staff:														
12	Chief Clerk and Assistants (175–330)	—	5	4	4	3	3	2	—	—	—	—	—	21	4,436
8	Clerks and Mechanical Assistants. (125–150)	—	2	1	2	4	—	—	—	—	—	—	—	9	1,572
8	Clerk Assistants (75–150)	—	—	1	—	1	1	—	1	—	—	—	—	4	516
8	Clerk Computers (75–110)	1	2	1	[1]	1	1	—	2	—	1	1	—	11	949
	Additional Staff:														
	Mechanical Assistants	—	—	—	—	—	—	1	1	—	—	—	1	3	374
	Supernumerary Clerks	—	—	—	—	1	—	—	—	1	—	—	—	2	175
	Probationers	2	2[1]	3	4	2	1[1]	1	—	—	—	—	—	17	947
	Boy and Girl Clerks	—	5	1	1	2	—	2	2	1	1	—	—	15	709
	Office or Laboratory Boys and Improvers.	—	1	—	—	—	1	1	—	—	—	—	—	3	144
	Allowance for Vacancies and Revision.	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Office Keeper's Staff:														
2	Office Keepers ... (80–110)	—	2	—	—	—	—	—	—	—	—	—	—	2	203
	Storekeeper	1	[1]	—	—	—	—	—	—	—	—	—	—	2	98
	Caretakers	—	—	—	—	—	—	1	—	—	—	—	—	1	82
	Messengers	—	2	—	—	—	—	1	1	1	—	—	—	5	308
	Boy Messengers	—	2	—	—	—	1	—	—	—	—	—	—	3	88
	Cleaners	—	4	—	—	—	—	1	1	1	—	—	—	7	235
	Watchman	—	1	—	—	—	—	—	—	—	—	—	—	1	28
	Lift Attendant	—	1	—	—	—	—	—	—	—	—	—	—	1	53
	Occasional Sunday Duty ...	—	—	—	—	—	—	—	—	—	—	—	—	—	43
	Insurance (National Health and Employers' Liability).	—	—	—	—	—	—	—	—	—	—	—	—	—	45
	TOTALS	10	35	12	22	16	10	13	9	5	2	2	3	139	19,147
		10, £1670	95, £13,353					34, £4,079							
	Army Pay and deductions on account of members of the Staff on War Service.	9	3	3	1	2	2	2	1	0	0	1	1	25	2,543
	NET TOTALS													113	16,604

† On special service leave without pay.
[ ] Means that the occupant of the post is on duty with the Field Service or *vice versa*.

M.O. OBSERVATORIES. SCHEDULE III.

Service.	Kew.		Eskdale.		Valencia.		Falmouth.		Farnborough.		Benson.		TOTAL.		Edinburgh Office.		Auxiliary Observatories and Stations.	
	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.	1916-17.	1917-18.
EXPENDITURE.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Salaries (*see* Schedule II.)	1,726	1,817	1,353	1,060	512	516	119	126	246	65	470	495	4,426	4,079	—	—	720	770
Fixed Charges	—	—	—	—	—	—	30	30	—	—	—	—	30	30	350	350	400	400
Rent, Rates, Taxes, Repairs and Insurance...	80	80	50	50	61	60	1	—	1	—	2	2	195	192	—	—	15	10
Cost of Forms	40	40	60	80	4	4	—	—	1	—	1	1	106	125	—	—	160	150
Fuel and Lighting	75	100	120	120	18	18	—	—	—	—	5	5	218	243	—	—	—	—
Equipment and Instruments	100	100	100	100	100	50	60	50	50	50	100	100	510	450	—	—	—	—
Consumable Stores	20	25	30	30	8	6	2	2	15	20	60	30	135	113	—	—	—	—
Books, &c.	15	10	20	20	5	5	10	10	10	5	—	5	60	55	—	—	10	10
Incidental Expenses	50	25	20	15	5	5	10	13	1	5	5	5	91	68	—	—	90	60
Postage, Telephones and Telegrams ...	40	40	45	40	14	20	30	45	96	100	10	25	235	270	—	—	30	50
Travelling and Motor Car Expenses... ...	2	2	65	65	10	—	30	20	76	25	5	5	188	117	25	25	—	—
Reserve Fund	—	—	—	—	—	—	—	—	—	—	300	300	300	300	—	—	—	—
TOTALS (exclusive of Salaries) ...	422	422	510	520	225	168	173	170	250	205	488	478	2,068	1,963	375	375	305+400	280+400
APPROPRIATIONS IN AID.																		
Subventions: Gassiot Fund ... } Royal Society.	450	400	—	—	—	—	—	—	—	—	—	—	450	400	—	—	—	—
Parliamentary Grant } Royal Society.	—	—	1,000	1,000	—	—	—	—	—	—	—	—	1,000	1,000	—	—	—	—
Rosse Fund ... } Royal Society.	—	—	—	—	12	11	—	—	—	—	—	—	12	11	—	—	—	—
Advisory Committee... ...	—	—	—	—	—	—	—	—	250	250	—	—	250	250	—	—	—	—
War Office	—	—	—	—	—	—	—	—	21	65	—	—	21	65	—	—	—	—
Antarctic Fund	164	164	—	—	—	—	—	—	—	—	—	—	164	164	—	—	—	—
Grazing Rent	4	4	—	—	18	17	—	—	—	—	—	—	22	21	—	—	—	—
Rent of Rooms...	13	13	76	76	—	—	—	—	—	—	—	—	89	89	—	—	—	—
Testing Instruments and Commissions ...	60	20	—	—	—	—	—	—	—	—	—	—	60	20	—	—	—	—
Other Expenses refunded locally	18	30	20	20	—	—	10	15	—	—	—	—	48	65	—	—	100	100
TOTALS	709	631	1,096	1,096	30	28	10	15	271	315	—	—	2,116	2,085	—	—	100	100

It was agreed to make enquiry of Mr. Barstow as to the course which should be adopted in regard to normal increments of salary to members of the staff of the Office absent by permission on naval or military service.

610. OBSERVATORIES.—**Valencia.**—*Greenhouse.*—Reported—correspondence with the Superintendent of Valencia Observatory with regard to the maintenance of the greenhouse which Mr. Cullum, the late Superintendent, erected at his own expense. As the greenhouse cannot be accepted as a landlord's fixture, it was suggested in the correspondence that the matter is primarily for arrangement between outgoing and incoming Superintendents, and that reasonable facilities for securing a satisfactory arrangement should be given without committing either side. Mr. Dines says that he will keep the greenhouse painted but will not undertake extensive repairs.

Farnborough.—*Anemometer.*—Reported—that arrangements are in progress for the erection of a Dines Pressure Tube Anemometer with Direction Recorder on the top of Pyestock chimney near South Farnborough. The Superintendent of the Royal Aircraft Factory has agreed to render every assistance. As no suitable instrument is available, it is proposed to take the recording apparatus from Kew Observatory, and the recorder now in the Office will be forwarded to Kew. The mast and fittings are being made by R. W. Munro, Ltd.

Falmouth.—Reported—that Mr. Wilson Fox had called and represented that the expenses in connexion with the upkeep of the Observatory house at Falmouth exceeded the receipts for the three years ending 30th June, 1916, by £33 12*s.* 10*d.* According to tho arrangement of Minute 405, the Office pays a retaining fee to the Society of £30 a year as a contribution towards the upkeep, but by Recommendation 1 the Office undertakes to defray all expenses of the work and of the upkeep of the premises. Payment of £33 12*s.* 10*d.* was accordingly made to the Society.

Approved.

611. DIRECTOR'S REPORT AND ACCOUNTS.—Reported—that reports of work of the divisions of the Office and the Observatories for August, 1916, had been prepared and circulated.

Accounts.—Submitted—The following statement of the Bank Account in the Cash Book :—

	£	*s.*	*d.*
Balance on 12th September, 1916	641	9	9
Receipts from 13th September to 24th October, 1916	7,398	1	3
	8,039	11	0
Cheques drawn from 13th September to 24th October, 1916... ...	2,781	7	5
Balance on 24th October, 1916	£5,258	3	7

Reported—that owing to the delay of the repayment of the cost incurred for instruments ordered for the Royal Naval Air Service, the balance to the credit of the Office shown in the cash accounts to 30th September, £41 10*s.*, being less than the cash in hand at the Office, was not sufficient to meet the cheques ordinarily dated 30th September.

Submitted—The following Statement of Accounts for the six months ended 30th September, 1916, prepared for audit by the Comptroller and Auditor-General :—

RECEIPTS.						PAYMENTS.					
1915. £ s. d.		£ s. d.	1916. £ s. d.			1915. £ s. d.		£ s. d.	1916. £ s. d.		
861 16 6	Balance from year 1915-16	—	2,208 15 5			500 0 0	Director	—	500 0 0		
11,250 0 0	Parliamentary vote	—	11,250 0 0				OFFICE SALARIES (including Insurance) :				
	DEPARTMENTAL EXPENSES REPAID :					4,402 9 1	Monthly	4,652 19 10			
						556 3 0	Weekly	779 16 10			
3 12 11	Forecasts, &c. ...	1 14 0					EXPENSES OF OFFICE :		5,432 16 8		
	Marine, Statistical, and Administrative	29 7 2				342 6 7	Rent, Heating, and Lighting	343 5 10			
40 3 6	Instruments ...	35 10 2				40 6 0	Furniture and Equipment	81 11 10			
			66 11 4			12 11 10	Library	14 7 10			
	INCIDENTAL EXPENSES REPAID :						Insurances and Repairs				
50 1 7	D.W. Report ...	36 16 1				60 8 3	Incidental Expenses, and Consumable Stores	3 15 0			
38 14 1	Divisional ...	46 5 3				143 19 2	Advertising Account	129 4 4			
2 11 1	Advertising Account	2 11 8				13 19 2	POST OFFICE :	3 15 0			
			85 13 0				Postage	373 1 4	575 19 10		
40 6 0	STATIONERY OFFICE	—	21 14 7			318 19 9	Telephones	91 11 6			
	TELEGRAPH CHARGES REPAID					86 0 10	Telegrams	1,213 9 8			
45 17 6		—	142 17 9			839 13 8			1,678 2 6		
	TELEPHONE CHARGES REPAID					88 17 5	STATIONERY OFFICE...	—	70 1 5		
2 6 8		—	16 4			106 11 8	TRAVELLING EXPENSES	—	103 17 1		
152 0 0	INSPECTIONS ...	—	76 0 0				SUPERANNUATION :				
	INSTRUMENTS :					212 10 0	Pensions not chargeable on Fund ...	99 3 4			
1 10 0	Royal Navy ...	2,011 0 0				125 16 10	Pensions chargeable on Fund	137 16 0			
	Mercantile Marine,					381 5 0	Annuities	281 5 0			
600 17 11	Stations, &c. ..	369 14 2				665 1 6	Contribution to Fund	—			
			2,380 14 2						518 4 4		
	SUPERANNUATION ACCOUNT :						COST OF INSTRUMENTS :				
						985 5 7	Royal Navy	2,011 17 6			
396 17 8	Annuities... ...	292 10 0				100 16 6	For Office use ...	93 0 7			
1 0 4	Interest on Investments	16 2 9				619 6 5	Other commissions	2,790 3 0			
			308 12 9						4,895 1 1		
	*OBSERVATORIES, BRANCHES, AND STATIONS :						*OBSERVATORIES, BRANCHES, AND STATIONS :				
124 14 1	Kew	291 8 6				1,044 14 0	Kew	1,090 15 8			
510 3 10	Eskdale	514 5 3				668 14 8	Eskdale	908 4 8			
8 15 0	Valencia	8 15 0				336 4 9	Valencia	321 7 4			
262 16 2	Farnborough ...	256 13 9				269 13 8	Farnborough ...	402 8 2			
3 2 4	Falmouth... ...	7 0 8				102 6 10	Falmouth	115 11 9			
—	Benson	10 0 0				210 7 0	Benson	230 13 7			
						186 0 6	Edinburgh	186 16 6			
93 10 11	Miscellaneous ...	48 12 3				645 8 9	Miscellaneous ...	607 0 4			
			1,136 15 5						3,862 18 0		
9 4 9	LECTURES AND EXPERIMENTS ...	—	—			422 18 3	BALANCE : Cash at Bank ...	—	—		
						62 17 1	,, at Office ...	52 7 8	—		
—	TO BALANCE ...	—	17 17 10			—	Advance for Travelling Expenses ...	7 0 0	59 7 8		
£14,551 13 9			£17,696 8 7			£14,551 13 9			£17,696 8 7		

* For details, see separate statement.

Statement of Assets and Liabilities at 30th September, 1916.

LIABILITIES.						ASSETS.					
£ s. d.			£ s. d.			£ s. d.			£ s. d.		
—	To Bank of England		17 17 10			485 15 4	By cash at Bank and at Office ...		52 7 8		
2,297 14 11	,, sundry creditors		3,579 8 7			16 7 8	,, salaries reserved (premiums) ...		16 8 2		
						372 8 1	,, M.O. instruments in stock ...		741 14 9		
—	,, Superannuation		122 18 6				,, sundry debtors, including advance for Travelling Expenses ...		1,820 2 3		
537 2 5	,, balance		1,937 2 2			664 19 8					
						1,295 6 7	,, Admiralty		3,026 14 3		
£2,834 17 4			£5,657 7 1			£2,834 17 4			£5,657 7 1		

NOTE.—On 30th September the amount of Government securities held for the provision of Superannuation Annuities was £26 14*s.* 2*d.* 2½ per cent. Consols, and £702 10*s.* 2*d.* 4½ per cent. War Loan.

Observatories.—Statement of Accounts for the six months ended 30th September, 1916.

KEW.

1915. £ s. d.	Receipts.	£ s. d.	1915. £ s. d.	Payments.	£ s. d.	1916. £ s. d.
82 0 0	Subvention, Scott Antarctic Fund 41 0 0		862 6 4	Salaries, Scheduled... 857 15 3		
—	Gassiot Trust 194 5 2		15 10 10	Sunday and holiday duty 20 10 7		
		235 5 2			878 5 10	
2 4 7	Expenses refunded locally ...	48 3 9	11 11 5	Cost of forms, &c.	16 13 4	
30 11 6	Tests and Commissions	3 3 7	40 1 7	Rent, Rates, Taxes, Repairs and Insurance	59 6 1	
9 18 0	Cost of books and forms refunded	4 16 0	50 0 4	Fuel and lighting	38 3 8	
919 19 11	Balance	799 7 2	19 2 4	Equipment and instruments ...	52 4 10	
			11 0 1	Consumable stores	11 12 9	
			7 0 6	Incidental expenses	9 15 10	
			1 11 6	Books, &c.	2 10 8	
			25 16 8	Postage, telephones and telegrams	21 18 3	
			12 5	Travelling expenses	4 5	
£1,044 14 0		£1,090 15 8	£1,044 14 0		£1,090 15 8	

ESKDALE.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
500 0 0	Subvention, Royal Society ...	500 0 0	475 12 2	Salaries, Scheduled	520 3 0
10 3 10	Expenses refunded locally ...	14 5 8	28 11 9	Cost of forms, &c.	43 19 0
158 10 10	Balance	393 19 0	26 6 11	Rent, Rates, Taxes, Repairs and Insurance	3 1 6
			56 12 6	Fuel and lighting	23 3 11
			7 7 9	Equipment and instruments ...	17 12 6
			13 13 3	Consumable stores...	15 2 11
			2 11 10	Incidental expenses	5 13 9
			2 13 11	Books, &c.	2 2 9
			27 4 1	Postage, telephones and telegrams	31 19 9
			28 0 6	Travelling and motor car expenses	245 5 7
£668 14 8		£908 4 8	£668 14 8		£908 4 8

VALENCIA

£ s. d.		£ s. d.	£ s. d.		£ s. d.
—	Subventions (Rosse Fund) ...	—	235 4 5	Salaries, Scheduled	258 4 2
8 15 0	Expenses refunded locally ...	8 15 0	1 16 2	Cost of forms	2 9 10
327 9 9	Balance	312 12 4	60 14 11	Rent, Rates, Taxes, Repairs and Insurance	32 13 9
			8 15 0	Fuel and lighting	7 6 2
			9 14 11	Equipment and instruments ...	3 9 11
			3 10 5	Consumable stores	1 11 0
			5 10	Incidental expenses	8 11
			1 0 4	Books, &c.	1 8 0
			13 11 0	Postage, telephones and telegrams	13 15 7
			1 11 9	Travelling expenses	—
£336 4 9		£321 7 4	£336 4 9		£321 7 4

FARNBOROUGH BRANCH OFFICE.

£ s. d		£ s. d.	£ s. d.		£ s. d.
250 0 0	Subvention (Advisory Committee for Aeronautics)	250 0 0	160 14 6	Salaries, Scheduled	17 4 0
			1 8	Cost of Forms	—
12 16 3	Expenses refunded (War Office) ...	6 13 9	7 9	Rent, Rates, Taxes, Repairs and Insurance	—
6 17 5	Balance	145 14 5	11 13 9	Equipment and instruments ...	341 5 6
			7 0 3	Consumable stores	10 2 7
				Incidental expenses	18 8
			2 15 0	Books, &c.	1 8 0
			48 4 8	Postage, telephones and telegrams	30 17 9
			38 15 5	Travelling and motor car expenses	11 8
£269 13 8		£402 8 2	£269 13 8		£402 8 2

FALMOUTH WEATHER STATION.

£ s. d.		£ s. d.	£ s. a.		£ s. d.
3 2 4	Expenses refunded locally ...	7 0 8	15 0 0	R. Cornwall Polytechnic Society...	15 0 0
99 4 6	Balance	108 11 1	42 10 10	Salaries, Scheduled	59 17 6
			2 6	,, Additional	—
			9 6	Rent, Rates, Taxes, Repairs and Insurance	—
			10 11 0	Equipment and instruments ...	1 7 2
			1 6 11	Consumable stores	1 0 11
			11 2	Incidental expenses	15 8
			17 12 8	Postage, telephones and telegrams	29 12 3
			14 2 3	Travelling expenses	7 18 3
£102 6 10		£115 11 9	£102 6 10		£115 11 9

BENSON.

1915.	Receipts.	1916.	1915.	Payments.	1916.
£ s. d.		£ s. d.	£ s. d.		£ s. d.
—	Expenses refunded locally ...	10 0 0	181 16 3	Salaries, Scheduled	170 6 6
210 7 0	Balance	220 13 7	8 0	Overtime, &c.	6 0
			—	Cost of forms, &c.	—
			2 0 0	Rent, Rates, Taxes, Repairs and Insurance	—
			13 0	Fuel and Lighting...	1 10 0
			3 13 2	Equipment and instruments ...	28 5 1
			12 5 4	Consumable stores	11 17 6
			1 18 0	Incidental expenses	2 7 0
			—	Books, &c.	1 11 6
			7 13 3	Postage, telephones and telegrams	12 9 0
			—	Travelling expenses	2 1 0
£210 7 0		£230 13 7	£210 7 0		£230 13 7

METEOROLOGICAL OFFICE, EDINBURGH.

£ s. d.		£ s. d.	£ s. d.		£ s. d.
186 0 6	Balance	186 16 6	175 0 0	Subvention	175 0 0
			11 0 6	Travelling expenses	11 16 6
£186 0 6		£186 16 6	£186 0 6		£186 16 6

MISCELLANEOUS STATIONS.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
93 10 11	Cost of forms refunded	48 12 3	172 5 0	Subventions: Aberdeen, Armagh ...	172 5 0	
551 17 10	Balance	558 8 1	42 10 0	British Rainfall Organization	12 10 0	
						184 15 0
			269 14 10	Salaries of Observers (32) ...		306 4 0
			118 12 0	Cost of forms, &c.		53 9 6
			6 5 8	Rent, Rates, Taxes, Repairs and Insurance		4 3 6
			—	Equipment and instruments ...		9 7 4
			—	Consumable stores		19 6
			22 1 4	Agents' fees, &c.		21 10 2
			4 6 6	Books, &c.		2 16 6
			9 13 5	Postage, telephones and telegrams		23 14 10
£645 8 9		£607 0 4	£645 8 9			£607 0 4

METEOROLOGICAL FIELD SERVICE.

FRANCE.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
—	War Office			Salaries:		
360 6 8	Balance	200 7 2	88 0 6	Major E. Gold ...	15 18 8	
			26 19 6	Lieut. A. E. M. Geddes	—	
			11 12 6	Lieut. A. H. R. Goldie	8 10 10	
			—	Lieut. E. H. Chapman	—	
			16 0 3	Lieut. C. D. Stewart	—	
			7 6 10	Lieut. F. Entwistle	—	
			—	Sergt. R. Pyser ...	20 15 8	
			—	Corpl. E. L. Clinch	17 2 0	
			—	Corpl. A. G. Goad ...	28 18 10	
					91 6 0	
			—	Cr.—Amounts refunded	24 16 8	
						66 9 4
			5 19 8	Salaries: Overtime		—
				Incidental Expenses:		
			3 15 7	Postage	10 17 2	
			—	Telegrams ...	—	
			13 5	Printed books ...	—	
			7 6 1	Miscellaneous ...	12 6	
						11 9 8
			192 12 4	Instruments		122 8 2
£360 6 8		£200 7 2	£360 6 8			£200 7 2

DARDANELLES.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
—	Admiralty	124 5 6		Salaries:		
—	War Office	186 1 2	15 12 6	Capt. E. M. Wedderburn	—	
25 6 8	Balance	587 1 6	—	Corpl. C. V. Ockenden	4 6 8	
						4 6 8
			9 14 2	Salaries: Overtime		19 10 6
				Incidental Expenses:		
			—	Postage	5 14 7	
			—	Telegrams ...	560 16 0	
			—	Printed books ...	—	
			—	Miscellaneous ...	1 11 8	
						568 2 3
			—	Instruments		305 8 9
£25 6 8		£897 8 2	£25 6 8			£897 8 2

SEVENTY-FIFTH MEETING.

South Kensington, S.W., 22nd November, 1916.

PRESENT :

THE DIRECTOR, IN THE CHAIR.

MR. BARSTOW.	MAJOR LYONS.
THE HYDROGRAPHER.	DR. SCHUSTER.

612. The Minutes (604–611) of the last meeting, 25th October, 1916, previously circulated, were taken as read and confirmed.

613. CORRESPONDENCE.—**Board of Trade.**—*Prohibition of export of Barometers.*—Reported—correspondence (C. 11/S) with the Admiralty and the Board of Trade respecting the prohibition of the export of barometers and thermometers suitable for ship's use, except under licence ; in which the Admiralty suggested that applications for permission to export these instruments should be referred to the Meteorological Office for their observations. It has finally been arranged that the Meteorological Office should deal with applications for permission to export barometers and that the Ministry of Munitions of War should deal with thermometers, as they have undertaken the entire supply of thermometers. The Office has suggested to the Board of Trade that instrument makers should be notified that permission for the export of these instruments is now required.

West Hartlepool Nautical Academy.—*Meteorological Agency.*—Read—letter 3696 of the 14th November from the principal of the West Hartlepool Nautical Academy applying for an appointment as agent to the Meteorological Office in the West Hartlepool district, and stating that in his nautical academy masters and men are trained, and that he carries on a nautical optician's business and does all the Admiralty work in the district.

It was agreed that no agent for the Office is required in West Hartlepool, but arrangements may be made for the sale of M.O. publications at the Academy and other similar establishments.

Rear-Admiral Dampier.—*Weather Reports for Ships.*—Reported—correspondence concerning notable variations in the direction and force of the wind during a week when the variations of pressure recorded locally on the barograph were quite unimportant, and their explanation by the existence of large fluctuations shown on barograms from other neighbourhoods, and leading up to the suggestion by Admiral Dampier that he should be supplied, provisionally, with barometer readings at selected stations and test his skill in forecasting from them. Admiral Dampier had been informed that all the desired information was included in the Daily Weather Report, which was confidential for fourteen days, and that for the supply of the information within that period to a Naval Officer the initiative, so far as the Office is concerned, must come from the Admiralty.

Approved.

Captain Schwann.—*Weather Reports for Naval Establishments in the far north.*—Read—Admiralty letter giving instructions for communicating with the "Campania" and forwarding a memorandum from Captain Schwann asking to be supplied, in accordance with a practice previously in operation for the naval air service, with a coded description of the distribution of pressure according to numbered squares, which would form the basis of forecasts to be drawn up for the locality by a naval officer at the base and replace the general description of weather and forecast for the British seas which is now issued by the Office to the Admiralty, and is found not always to apply to the extreme north on account of its remoteness from the Central Office.

Also the Director's reply explaining that the remoteness of the locality was of no importance in an office where everything was dependent upon information received by telegraph, and that the matters of consequence were the number and distribution of the reporting stations: that the general description of the map which it had been the practice to transmit by wireless to naval air stations though sufficient to inform individual airmen of the general features of the situation would not be found sufficient for an officer who undertook the responsibility of issuing forecasts upon which action of vital consequence might be based by those in command. It is found in practice that nothing short of the actual observations will satisfy a forecaster and it was therefore suggested that instead of reintroducing the general description of the map it would be better to transmit a copy of the actual observations upon which a map could be compiled and forecasts prepared by an officer with special training sent in the first instance from the Meteorological Office for the purpose, as in the case of the corresponding duty at G.H.Q. in France and Salonika which had been successfully provided for in that way.

A general approval was given to the action taken and the Director was authorised to discuss with the Hydrographer the means of meeting in the manner suggested the requirements of the Naval Air Service and of other naval departments.

Vice-Admiral Bacon.—*Gunnery.*—Reported—correspondence and interview respecting the explanation of irregularities in the range of projectiles which might be due to changes in the meteorological conditions.

Captain A. V. Hill.—Reported—correspondence respecting the use of mirror-position finders for determining the winds of the upper air, and a visit of Mr. Lempfert to see the experiments.

Squadron Commander Cave Brown Cave.—*Height and Thickness of Clouds.*—Reported—correspondence respecting the most suitable arrangements for an observation car attached to a dirigible having regard to the probable height of the base and the vertical thickness of cloud, for which material had been collected from Farnborough and Eskdalemuir and had been compiled from the reports of the upper-air observations at Lindenberg by Mr. Hawke.

614. Office Staff.—**E. P. Pearce.**—The Director was authorised to appoint E. P. Pearce, formerly in the employment of Short and Mason, Ltd., as an additional member of the Staff in the Instruments division at a salary of £150 per annum in order to meet the exceptional requirements of the Navy and the Air Services in respect of instruments.

In consideration of various representations the following are approved:—

Miss D. G. Chambers.—To become clerk-assistant on taking over the charge of the accounts of stores of forms, &c., with charge of Room 22. (Minute 599.)

Miss R. M. Chambers.—Promotion to be clerk-computer on taking over the duty of assisting in the Accounts section.

Commissionaire Chillman.—Payment of the war bonus as defined by Minute 606 although his appointment is dated subsequent to 1st October, 1915.

Miss Winifred Bulgin.—Appointment as girl clerk, Order 528, in place of Miss Baron, resigned.

Miss Frances Augusta Shields.—Appointment as probationer, Order 529.

Albert Henry French.—Appointment as Boy Messenger, Order 530.

War Bonus.—With reference to a request for a ruling as to their positions with regard to the war bonus in respect of their salaries in consideration of the fact that the rule for the civil service was to consider the ordinary salaries without including overtime, it was ruled that the regular attendances outside ordinary office hours which are provided for in Circular 002 are not to be regarded as overtime, as the total number of hours of attendance required does not exceed that required from other members of the staff; but that the special Sunday attendances under Orders 359 of 6th January, 1915, and 439 of 1st October, 1915, for which an additional payment of 5 per cent. of normal rates is allowed should be regarded as overtime, and on that ruling the war bonus should be allowed to Mr. Howard but Mr. Bench's salary must be regarded as exceeding the limit laid down by the Treasury for Civil Servants.

Mr. Tarrant.—Consideration of his position was deferred for further report on the position of the secretarial work of the office.

Mr. H. W. Baker.—The Director was authorised to apply to the Superintendent of the Royal Aircraft Factory, for the release of Mr. Baker's whole time or part time as may be arranged in order that he may resume duties at Benson in connection with the daily telegraphic reports, the work upon the upper air and the organisation of the recording of thunderstorms.

Mr. C. W. Broadbent.—The Director was authorised to employ as a voluntary assistant for work in connexion with the war Mr. C. W. Broadbent on the recommendation of Sir William Dunbar, Bart.

615. ESTIMATES FOR 1917–18.—A summary of the materials for estimates (Minute 609) was submitted showing that the projected expenditure would exceed the grant in aid by £571. The war bonus authorised by Minute 606 would require £300, the additional clerk in the Instruments Division £150 and additional staff in the Forecast Division necessary for meeting present requirements £300, making altogether £1,321.

In order to meet this deficiency the following modifications were authorised :—

	£
Allowed for vacancies—	
Secretary	350
Sub-editor	150
Reduced allowances—	
Instruments for office	150
Superannuation (additional contribution)	276
Travelling expenses	50
Telegrams from abroad	45
Observatories : Benson (contribution to reserve) ...	300
	£1,321

Payment to members of the staff with the Forces.—It was agreed that following the practice of the Civil Service a year's normal increment of salary should be allowed in the estimates for 1917–18 in computing the civil pay allowed to members of the office staff with the forces.

The estimates for the year 1917–18 with a covering letter to the Treasury were approved as follows :—

METEOROLOGICAL OFFICE. ESTIMATES for Year 1917–18.

—	Proposed, 1917-18.	Voted, 1916–17.	Increase.	Decrease.
	£	£	£	£
Director	1,000	1,000	—	—
Salaries :				
Office	12,648	11,304	1,344	—
Observatories	4,079	4,426	—	347
Meteorological Field Service	1,670	1,958	—	288
Expenses of Office :				
Rent, heating, and lighting	700	700	—	—
Furniture and equipment	100	100	—	—
Library	50	50	—	—
Insurances and repairs	120	120	—	—
Incidental expenses and consumable stores	250	250	—	—
Post Office charges :				
Postage	750	750	—	—
Telephones	100	100	—	—
Telegrams	2,665	2,004	661	—
Stationery Office (S.O.P.)	120	80	40	—
Travelling expenses	200	250	—	50
Superannuation allowances :				
Annuities	562	712	—	150
Pensions not chargeable on Fund	25	425	—	400
„ chargeable on Fund	276	516	—	240
Contribution to Fund	474	234	240	—
Cost of instruments	8,300	2,450	5,850	—
Expenses of M.O. Observatories :				
Subventions	30	30	—	—
Rent, rates, taxes, repairs, and insurances	192	195	—	3
Fuel and lighting	243	218	25	—
Equipment and instruments	450	510	—	60
Cost of forms	125	106	19	—
Consumable stores	113	135	—	22
Books, &c.	55	60	—	5
Incidental expenses	68	91	—	23
Postage, telegrams, and telephones	270	235	35	—
Travelling and motor car expenses	117	188	—	71
Reserve Fund	—	300	—	300
Expenses of auxiliary observatories, &c. :				
Subventions (2)	345	345	—	—
Telegraphic, anemographic and W.W.R. stations	770	720	50	—
Incidental expenses of stations and ships, &c.	280	305	—	25
British Rainfall Organization	55	55	—	—
Edinburgh Office	375	375	—	—
Lectures and experiments :				
Schuster Readership	—	—	—	—
	37,577	31,297	6,280	—
APPROPRIATIONS IN AID.				
Subventions for observatories :				
Advisory Committee for aeronautics	250	250	—	—
Royal Society	1,400	1,462	—	62
War Office	65	21	44	—
Antarctic Fund	164	164	—	—
Expenses refunded :				
M.O. observatories	206	219	—	13
Auxiliary observatories and stations	100	100	—	—
M.O. departmental	215	250	—	35
M.O. incidental	170	165	5	—
Stationery Office account	120	70	50	—
M.O. telegraphic expenses	1,150	30	1,120	—
M.O. telephone charges	2	—	2	—
Inspections	100	100	—	—
Instruments (Royal Navy)	4,000	1,000	3,000	—
„ (other sources)	4,000	1,000	3,000	—
Superannuation annuities and interest	592	742	—	150
Lectures and experiments	—	—	—	—
Total Appropriation in Aid	12,534	5,573	6,961	—
Army Pay, and deductions on account of members of the Staff on War Service	2,543	3,224	—	681
Net Totals	15,077	8,797	6,280	—
Parliamentary Grant in Aid	22,500	22,500	—	—

Letter to the Treasury.

METEOROLOGICAL OFFICE—ESTIMATES FOR 1917–18.

27th December, 1916.

SIR,

IN reply to Treasury letter 28741/16 I am instructed by the Meteorological Committee to forward an estimate of the expenses of the Meteorological Office in the year 1917–18.

The estimate of expenditure has been curtailed in order to bring the net total within the grant-in-aid.

When the items of expenditure necessary to continue the work of the various divisions and establishments of the Office as it now exists, after the various extensions called for by the demands of the Admiralty and War Office were set down, it was found that the estimated expenditure exceeded the fixed grant by £1,321. The work as it now exists is more than sufficient for the staff, in spite of the fact that the Committee have borrowed Major Lyons' services from the War Office for work in connexion with the Mediterranean Expeditionary Force, and that they utilise the services of the officers and men of the Meteorological Section R.E. who are temporarily in this country; in spite, moreover, of the fact that various voluntary agencies have been established in connexion with the Intelligence Services to do work which forms part of the ordinary training of the office staff.

Need is particularly felt in the staff concerned with general administration.

The increase of expenditure which is referred to in the preceding paragraphs, and which with Their Lordships' leave may be called automatic, arises from the following causes:—

1. The increase in cost of postage and telegrams.
2. The increase in the work of the forecast division to meet the needs of the Navy, Army and their Air services with which is included extra pay at certain stations for an additional service of observations at 1 a.m. found to be essential for the early morning work of the Air services.
3. The necessity for having a continuous supply of competent graduates in training to meet the demands of the Army as they arise, for officers with professional qualifications.
4. The payments in accordance with the practice of the Civil Service to supplement the military pay of members of the staff serving with the forces, whose work could not be left unprovided for.
5. Increased rates of pay for women clerks in the special circumstances of the time and a war bonus at Civil Service rates for members of the staff whose pay does not exceed £3 a week.
6. The initiation of a small payment for observers at "district stations of the Weekly Weather Report" to avoid as far as possible the break-down of continuity in a work begun in 1878, in which a break of continuity is fatal.
7. The necessity for retaining in employment members of the staff who reach the age of retirement, but are not retired for reasons, which it is unnecessary to detail—but which are not strong enough to justify the refusal of all promotion to the junior staff employed on work which must be maintained.

If these grounds be good the estimate of expenditure for the coming year is not quite sufficient to support the work as it ought to be supported. The Committee have brought the figures within the Grant-in-Aid by suppressing all the margins for exceptional expenditure and contingencies at the Office and observatories. These include items upon which the true life and efficiency of an institution of this kind depend and should the demands of the services increase the provision will be insufficient. The Committee therefore trust that Their Lordships will understand that while they have taken all possible steps to keep the expenditure at the lowest figure, they do not think it would be in the best interest of the country at this time, when the calls upon the Office cannot be foreseen to treat the estimates which are now presented as being so rigorously binding as the Committee have always considered a grant-in-aid to be.

I am, &c.,
NAPIER SHAW.

The Secretary,
H.M. Treasury.

616. MARINE OBSERVATIONS.—Read—a memorandum from Captain Hepworth representing the decline in the number of contributing observers in consequence of ships carrying Office instruments for the purpose of observing, being taken over by the Admiralty and no return of their observations being made to the Office.

The Hydrographer reported that marine meteorological observations were being received at the Admiralty and will be preserved there until the termination of the war.

617. DIRECTOR'S REPORT AND ACCOUNTS.—*Visit to Eskdalemuir.*—The Director reported that he had visited Eskdale Observatory from 1st to 5th November, 1916, and that authority was required for the payment of his travelling expenses, amounting to £4 13*s.* 3*d.*

Approved.

Nottingham Observer.—Reported—correspondence with the City Engineer of Nottingham regarding the calling up for service of W. A. Johnson, in charge of the Nottingham Reporting Station. He is over 41 years of age and passed for

garrison duty (C 2) in England only. The Director wrote to the Director-General of Recruiting pointing out the importance of the meteorological work done at Nottingham in connexion with the forecasts for the Naval and Military Services, and the War Office issued instructions that Mr. Johnson was not to be called up for service with the Colours. (3554/4. S/2.)

Publications.—*Cape to New Zealand Charts* (M.O. 123).—The Director reported that an urgent requisition for 50 copies of the charts for the Admiralty had been received but only five could be supplied. Instructions had been given to the Marine Division for the preparation of a revised edition including the correction of the pressure values for latitude. In connexion therewith the peculiarities of the projection of the charts made them very unsuitable for representing the relation of pressure to winds, and it was agreed that the publication should as far as possible be revised in form as well as detail before re-issue.

Tabulator's Handbook.—Submitted—MS. of instructions in the tabulation of magnetic records and the reading of magnetic observations, which it is proposed to print as an instalment of the "Tabulator's Handbook."

Approved.

Computer's Handbook.—A further section (Section 2, § 2) of this Handbook, dealing with the investigation of the upper air is now ready to go forward.

Monthly Flysheet.—In order to have the information about weather conditions of the British Isles up to date for all purposes it is proposed to issue on the first day of each month a summary of the weather of the month just elapsed, based upon the reports from observatories and weather stations with six additional telegraphic stations and one Dublin station. The information would be arranged generally on the lines of the frequency tables published at the end of the "Weather Map," it would be in the form required subsequently for the Annual Summary and would not duplicate what is now included in the *Monthly Weather Report.* It is proposed to distribute to various departments, observers, newspapers, &c., a limited number of copies which will be produced by typewriting process.

To bring the information at the telegraphic reporting stations into line in view of the importance of terrestrial radiation in the study of fog, it is proposed to provide grass-minimum thermometers for those telegraphic stations, which will appear in the Reports, and to increase the allowance to the observers on that account according to the recognised scale.

Original Papers.—Mr. Whipple has prepared a paper on the *movement of a body on a rotating earth under no forces.*

It was agreed that it be communicated to the Philosophical Magazine.

Mr. Bilham has prepared a paper on the variation of *underground-water-level at Richmond* (*K.O.*) and is engaged in further work on the subject.

Mr. Newnham has prepared an entropy-temperature diagram for dry and saturated air which has been required for a long time in order to enable meteorologists to follow the thermodynamical processes of the atmosphere. The data are based upon the work of Hertz and Neuhoff but the transformation into the entropy-temperature form is entirely new. Incidentally Mr. Newnham has prepared a number of other useful thermodynamic diagrams which it is proposed to include in the Computer's Handbook.

Approved.

Accounts.—Submitted—The following statement of the Bank Account in the Cash Book :—

	£	s.	d.
Balance on 24th October, 1916	5,258.	3	7
Receipts from 25th October—21st November, 1916	1,299	3	3
	6,557	6	10
Cheques drawn from 25th October—21st November, 1916	2,974	10	5
Balance on 21st November, 1916	£3,582	16	5

SEVENTY-SIXTH MEETING.

South Kensington, S.W., 24th January, 1917.

PRESENT:

THE DIRECTOR, IN THE CHAIR.

CAPTAIN HARVEY. | MAJOR LYONS.

DR. SCHUSTER.

618. The Minutes (612–617) of the last Meeting (22nd November, 1916), previously circulated, were taken as read, and confirmed.

619. CORRESPONDENCE.—**Treasury.**—*Estimates for* 1917–18.—Read—the following letter 202 from the Treasury, in reply to the letter printed in Minute 615 :—

34,976/16.

Treasury Chambers,
13th January, 1917.

SIR,

IN reply to your letter of the 27th ultimo, C. 06 (3,552), transmitting the annual estimates of the Meteorological Office, I am directed by the Lords Commissioners of His Majesty's Treasury to inform you that They propose to ask Parliament to vote an inclusive grant of £22,500 in aid of the expenses of the Office for 1917–18.

While noting the remarks of the Committee in the concluding paragraph of your letter as to the basis on which these estimates have been prepared, My Lords are glad to find that, in spite of increasing demands from the military forces and the grant of a war bonus to their staff, the Committee do not ask for an increase in the grant in aid of the Office for the coming year.

I am, &c.,
T. L. HEATH.

The Director,
Meteorological Office.

Admiralty.—*Departmental Expenses on Instruments Supplied.*—Arising out of a letter from the Accountant-General of the Navy asking for receipts for instruments supplied to Salonica, at the request of the Admiralty, the Director reported that it had been the practice in the past not to charge departmental expenses for work done for government departments, although Colonial Governments are charged 5 per cent. to cover the time occupied by the office on their behalf. At present, accounts ready to go forward to the Admiralty for supplies to the Air Department, and to the War Office, Home Defence Wing and Geographical Section amount to £1,507 17*s.* 3*d.* It has been necessary to obtain an additional clerk in the instruments division to deal with the extra work involved by war orders. For the Admiralty dockyard work a sum of £100 per year is regularly received to cover departmental expenses.

It was agreed to charge departmental expenses in future at the rate of 5 per cent. on all instruments, &c., supplied to Government Departments.

Jersey, Observatoire St. Louis.—*Publication of Results.*—Reported—correspondence with the Bureau Central Météorologique of Paris, M.O.3,599, with regard to the publication of daily meteorological observations from 1914, made at the Observatoire St. Louis, Jersey, belonging to the Jesuit Fathers for which no provision exists. The Bureau is willing to publish the observations, but as information from stations in France and French colonies appears only in the French Annales, M. Angot asks if objection would be seen to including Jersey observations on that ground. It was stated in reply that the observations ought to be published by this Office, and M. Déchevrens, the Director of the Observatory, has forwarded the results for 1914.

It was agreed that application be made to the Stationery Office for authority for the observations to be included with the Geophysical Journal, and for the 1914 observations to be issued as an appendix to the 1915 volume of the Journal.

620. OFFICE BUILDINGS.—**Accommodation for the Forecast and Instruments Divisions, &c.**—The Director read a memorandum on the congestion now existing in the forecast division, and a letter to the Treasury on the subject was approved.

621. OBSERVATORIES.—**Valencia.**—*Compulsory Tillage.*—Reported—Government regulations ordering that all Irish tenants will be required to till an additional tenth of their holdings in 1916. Also correspondence with Mr. L. H. G. Dines (M.O. 199 C.V. 22) on the subject of the tillage of the Observatory fields. Part of the holding is sub-let for grazing to Mr. Leslie, a neighbouring farmer, and the arrangement which has been sanctioned is that Mr. Leslie should give up immediately one of the fields in which is accommodated the pressure-tube anemometer, and take two others in exchange; and that this field be let in allotments to people in the neighbouring village of Cahirciveen. Further that notice be served on Mr. Leslie immediately to give up the whole of his grazing area from October next, when an entirely fresh agreement should be made out. The Superintendent is having the matter arranged by a solicitor on behalf of the Office.

Approved.

622. STATIONS.—**Guernsey.**—Reported—that on 28th December, 1916, the Commandant of the Meteorological Section had asked for daily observations at 1 a.m. from a station in the Channel Islands (M.O. 5,003). The observer at the telegraphic reporting station at Jersey is a station-master; he cannot arrange for the necessary observation, as he has no one with whom the work could be shared and there are no facilities for the despatch of telegrams. The assistance of the General Commanding Guernsey and Alderney District had therefore been asked. He reported that he had been in communication with the Senior Naval Officer of the Channel Islands; the latter was applying to the Admiralty for sanction to establish a meteorological station at Fort George, Guernsey. The sanction of the Admiralty had been received, and arrangements are now going forward for observations to be made daily at Fort George at 1 a.m. and 1 p.m. to supplement the Jersey observations, which are at 7 a.m. and 6 p.m.

Approved.

Payment for 1 a.m. Service—Read—Letter 5,029 of 5th January from Mr. H. H. Trevise, lately assistant light-keeper at the Dungeness Lighthouse and now employed at the Lighthouse on the Admiralty Pier, Dover, with regard to an allowance of £6 a year which, with the approval of the Trinity House, is now being paid as additional remuneration for the 1 a.m. messages to lighthouse keepers from 1st October, 1916. Mr. Trevise, who left Dungeness at the end of September, asks that the payment should be made retrospective to the date when the messages commenced, that is from October 1st, 1914.

The Director explained that the 1 a.m. duty was undertaken as voluntary assistance when the war broke out, and that the question of payment had only been raised recently, in view of the prolongation of the war.

It was agreed that the Committee are unable to accede to Mr. Trevise's request.

623. OFFICE STAFF.—**Meteorological Section R.E.**—Read—informal correspondence between the Director, Mr. Barstow and Sir R. Brade, Permanent Secretary of the War Office, regarding the organisation of the Meteorological Section, and suggesting that the three parts of the Section, in France, Macedonia and at the Meteorological Office should be combined and placed in charge of a Senior Officer of staff-rank. The War Office was not yet convinced of the advantages of the proposal.

It was agreed that the Director should consult Mr. Barstow further upon the matter and report further.

Release of Members of the Staff for Military Duty.—Reported—correspondence with the Substitution Officer, War Office and the Board of Trade, Labour Exchange, on the subject of the substitution of exempted men in the Office by men who have been discharged from the Army or are unfit for active service abroad.

R. P. Matthews and J. G. Ellis had been accepted for duty in the Forecast Division to replace two of the following three:—C. C. Newman; C. F. J. Jestico; R. M. Poulter. A. L. Goodwin had been employed as additional Office Keeper to replace C. S. Herbert.

Orders appointing R. P. Matthews, J. G. Ellis and A. L. Goodwin have accordingly been issued, and the exempted men will remain until the first two substitute sbecome proficient.

The exemption card of C. S. Herbert has been withdrawn, and he has been ordered to join the colours on 30th January. He has been absent six weeks with influenza, but has been classed as fit for garrison duty abroad.

A. L. Goodwin was appointed a month ago, but has only served 11 days and has been absent 20 days on sick leave on account of general debility and conjunctivitis; R. P. Matthews was also absent with nervous breakdown and J. G. Ellis with measles.

It was agreed that the services of A. L. Goodwin be dispensed with and that R. P. Matthews be released from further attendance.

It was suggested that application should be made to the Inspector of Police Victoria and Albert Museum for a retired police officer as third Office Keeper on the same terms as those framed for Goodwin.

Reported further—that with a view to providing a supply of men qualified to replace men who might be spared for military duty, arrangement had been made for the following to be transferred to the Office Staff:—

No. 106,403, Corporal W. C. Kaye, R.E., invalided (appendicitis) after 10 months at the front, and now classed C 1. B. Sc. Birmingham, 1908, and for five years Mathematical and Science Master at King's College, Taunton.

No. 113,105, Corporal C. Pidsley, R.E., invalided (nephritis) after 5 months at the front, and now classed C 1. B.A., T.C.D., Final in Modern Languages, Mathematics and Elementary Physics.

These N.C.O.'s reported at the Office on 8th January, 1917, from A Reserve Co., Special Brigade, R.E., Withnoe Camp, Millbrook, Plymouth, and will be transferred to Meteorological Section, R.E.

H. Jeffreys.—Reported—application from Mr. Harold Jeffreys, Fellow of St. John's College, Cambridge, at present working for Sir J. J. Thomson at the Cavendish Laboratory on war-work, for a position in the Meteorological Office where his mathematical knowledge would be required. Mr. Jeffreys took a first-class in the Mathematical Tripos 1913, was Isaac Newton Scholar, 1914, and Smith's Prizeman, 1915.

The Director suggested that the theory and practice of gunnery needs re-examination in view of the observations of the upper air which have been accumulated during the last twenty years. The present text-books take no account of these observations, and he suggested that Mr. Jeffreys might be appointed to take up this question.

The suggestion was approved, and the Director was authorised to apply to the War Office for a certificate of exemption.

Professional Assistants.—Read—the following memorandum:—

The provision for professional assistants in the Salary list is as follows:—

Senior Professional Assistants, £225–£15–£300.

	£
C. E. P. Brooks, Librarian	225
J. S. Dines, Forecast Division	300
R. A. W. Watt, Farnborough	225
A. H. R. Goldie [Eskdalemuir], France, R.E., Met. Section	265

Junior Professional Assistants, £125–£15–£200.

C. D. Stewart [Falmouth], France, R.E. Special Companies	200
F. Entwistle [Farnborough], France, R.E, Met. Section	140
E. H. Chapman [M.O.], France, R.E., Met. Section	165
E. G. Bilham [Kew], Benson	140+25
E. V. Newnham [Benson], M.O.	140
E. H. Nichols [Kew temporary], R.F.C.	140
E. L. Hawke, Temporary M.O.	140
[2nd Lieut. Harris], Forecast	Army Pay.
*Discharged Sergeant J. F. Duffin, Forecast	170
*Discharged Sergeant-Major F. A. Ward, Forecast	150
*†W. Reserve, Corporal W. C. Kaye, Forecast	No salary provided.
*†W. Reserve, Corporal Pidsley, Forecast	No salary provided.

War bonus has not been given in the case of professional assistants. The salary of seniors is beyond the limit, and the salary of juniors was not intended to be on an economic basis but to carry on during a period of probation.

Mr. Duffin has represented that since the lapse of his pension on discharge he is worse off than he was at Alloa.

Mr. Newnham who has recently been transferred to London from Benson asks for reconsideration on the ground partly of equality and partly of the cost of living in London.

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* On trial with a view to replacing fit men who might be spared.

† Notification has now been received that these men are transferred to Meteorological Section, R.E., for duty at the Office. (February 14th, 1917.)

Mr. Ward recently appointed at £150 a year as a qualified person invalided from the Army (sergeant-major) claims reconsideration on the ground that he takes his turn of duty with officers who get all told not less than £290 a year with special consideration in the matter of income-tax.

Mr. Kaye and Mr. Pidsley were recently taken on trial as Corporals in the W. Reserve supposing that Army pay and allowances would be provided. That is not the case.*

The supply of qualified m n to take the posts is now at an end. The ordinary Office practice of a commencing salary and gradual increments is not suitable for temporary appointments such as these. A regulation of fixed rates for certain stages is more suitable.

The pay and allowance of a sub-lieutenant in the Meteorological Section, R.E., amount to £296 a year and certain exemptions as to income-tax.

The pay of an assistant in the Forecast Division on the clerical side may reach £250.

I suggest the following for—

PROFESSIONAL ASSISTANTS IN THE FORECAST DIVISION.

Temporary provision during the War.

Men who are retained on duty as Professional Assistants in the Forecast Division will be paid as follows :—

	£
During training	175 a year.
Provisionally on full duty	225 „
Confirmed on full duty	250 „

To date from 1st February, 1917.

The provision of the funds must be dealt with.

Meteorological Office,
24th January, 1917.

Approved.

War Bonus.—Reported—that the following boy and girl clerks, probationers and messengers had been appointed since 1st October, 1915, and were not in receipt of war bonus in accordance with Minute 606.

Central Office :—H. J. Bigelstone, Miss H. G. Chivers, Miss F. A. Shields, Miss G. K. Herbert, Miss M. Enderby, W. G. Palmer, A. H. French.

Kew Observatory :—A. H. Lupton, L. E. Fletcher.

Eskdale Observatory :—J. Graham.

Valencia Observatory :—M. J. Morley.

Reported further—that in making recent appointments it had been found necessary to include war bonus as part of the wages offered.

It was agreed that war bonus at the ordinary rates be allowed to the above members of the staff as from 1st January, 1917.

Forecast Division.—Reported—that in consequence of numerous cases of sick leave in the Forecast Division, the staff was now considerably below full strength, and that arrangements had been made to borrow a member of the staff of the Marine Division as draughtsman.

It was agreed that it is necessary to maintain the work of the Forecast Division, and for this purpose the staff should be brought up to strength by transferring from other divisions as might be necessary.

H. W. Baker (Minute 614).—Reported—letter dated 22nd January from the Royal Aircraft Factory regarding the Committee's request for the services of H. W. Baker to be recovered from the Factory, in order that he may take up again the manufacture of balloon meteorographs at Benson, in view of the increasing demands of the services for information regarding the meteorological conditions of the upper air. The letter suggests that Baker be transferred to Benson in two or three months' time, when he has made a journey to Switzerland in connexion with the supply of aneroid parts received from there.

It was agreed to accept the offer provided a certificate of exemption can be obtained from the War Office.

624. PUBLICATIONS.—**Barometer Manual, 8th edition.**—Copies of this Manual were placed on the table.

Normals for the Réseau Mondial.—Submitted—a compilation of normals for a number of stations over the Globe which are now being used in connexion with the publication of the Réseau Mondial.

It was agreed that these normals should be published after the war.

* *See* † note p. 197.

Charts for the Réseau Mondial, 1911.—Reported—that the tables for the Réseau Mondial, 1911, copies of which had been destroyed by fire, were being reset. In the meantime the Charts, which had not been destroyed, had been issued separately. Copies were placed on the table.

Calendar for 1917.—Reported—that the Calendar had been issued, with the modification that the left-hand pages of each opening, which were devoted to daily meteorological averages and extremes for the observatories, had, at the request of the Stationery Office, been omitted.

Weather of the British Coasts.—Read—letter from the Hydrographer dated 21st December, 1916, asking to be supplied with material for a small handbook which could be issued to the numerous small auxiliary vessels employed on the patrol of the coasts of the United Kingdom. The Hydrographer considers that the "Seaman's Handbook" contains all the necessary information, but that it covers much more ground than is required for the present purpose.

The Director reported that this work is being taken in hand by Mr. Brodie who is getting out suitable particulars of gales and fogs and by Mr. Broadbent, who is engaged upon the determination of frequencies of wind of various strengths and directions for inclusion in the handbook. Reported further—that diagrams showing the frequency of occurrence for each month of the year of cyclonic depressions in each of the 5° squares of Western Europe had also been prepared for the handbook by Mr. Hawke.

Summaries of Colonial Observations.—Reported—that in consultation with the Hydrographer, it has been arranged that a number of copies of the meteorological appendices of the various Admiralty Sailing Directions, containing tables of normals at coast stations all over the world, should be supplied to the Office. These will be bound to form a work of reference that will practically amount to bringing the tables of Buchan's Challenger report up to date.

Cost of Printing, 1915–16.—Submitted the following comparison of the sales of publications and of the cost of printing, &c., for 1914–15 and 1915–16, which had been supplied by the Stationery Office. The figures for the sales of publications which were reported last year (Minute 553) were noticed at the time to be abnormally large. The sales for 1915–16 may be compared with the corresponding sales for 1913–14, which amounted to £191 18*s.* 1*d.*

AMOUNTS RECOVERED BY SALES OF PUBLICATIONS ISSUED BY THE METEOROLOGICAL COMMITTEE.

1914–15.			*Sales through Stationery Office Agents.*	1915–16.		
£	*s.*	*d.*		£	*s.*	*d.*
40	0	0	Weekly Weather Report, including Monthly and Annual Summaries ...	33	11	8
16	10	4	Meteorological Charts of the North Atlantic Ocean	14	7	0
14	2	8	Meteorological Charts of the Indian Ocean	7	16	4
2	5	6	Annual Report of Meteorological Committee	1	3	7
24	6	0	Observer's Handbook, 1914 edition		—	
172	8	0	Seaman's Handbook of Meteorology	2	8	0
55	14	0	Marine Observer's Handbook	3	16	0
33	4	0	Report of International Meteorological Committee Meeting at Rome ...		—	
358	10	6		63	2	7
			Publications issued prior to 1915-16 :—			
38	8	8	Barometer Manual, 1912	17	17	4
22	2	0*	Observer's Handbook, 1914 edition	14	6	0
	—		Weekly Weather Report, &c.	2	17	0
25	0	0	Southern Ocean Charts		—	
8	2	6	Miscellaneous...		17	0
452	3	8		99	0	3
88	17	5	Sales of Publications and Forms by M.O.	70	1	5
34	17	7	Sales to the Royal Met. Soc. and the Scottish Met. Soc. of Monthly Weather Reports	35	19	0
575	18	8		205	0	8

* This amount refers to the 1913 edition.

STATEMENT SHOWING THE EXPENDITURE BY H.M. STATIONERY OFFICE FOR PRINTING, STATIONERY, &C., FOR THE METEOROLOGICAL OFFICE.

——	Printing.	Paper.	Binding.	Books and Stores.	Total.
	£	£	£	£	£
1914-15	1,756*	442*	165*	90	2,453*
1915-16 (estimated) ...	1,500*	480*	150*	170	2,300*

* These amounts include the cost of copies of Official Publications supplied for Departmental purposes.

625. METEOROLOGICAL SECTION, R.E.—Reported—that the Commandant of the Meteorological Section at G.H.Q. in France and the Officer Commanding, Meteorological Section at Salonika had been in England on leave, and had visited the Office.

Submitted—specimens of the Daily Weather Report now being issued at G.H.Q. to the Army.

Authority for the provision of various stores required at Salonika had been applied for.

626. DIRECTOR'S REPORT AND ACCOUNTS.—**Committee for the Investigation of Atmospheric Pollution.**—Reported—that the Committee for the Investigation of Atmospheric Pollution, of which the Director is Chairman, had made application to the Development Fund for a grant to enable them to carry on their experiments, and that the grant would receive favourable consideration provided that the Committee would co-ordinate their work with that of the Meteorological Office. The Committee for the Investigation are willing to do this.

No objection was raised to the proposal.

Investments.—*War Loan.*—It was agreed to convert the holding of £702 10*s.* 2*d.* 4½ per cent. War Stock, 1925–1945, to 5 per cent. War Loan, 1929–1947.

Exhibition.—At the request of Major-General R. M. Ruck, Major Lyons had suggested that the Office should contribute some items of general interest to an exhibition in connexion with aviation at the Grosvenor Gallery which was being arranged by Lady Drogheda for 22nd January. Mr. Clarke had been asked by telegram to supply eight ransparencies of enlargements of suitable cloud photographs, and had complied with the request, but the pictures arrived too late to be included in Lady Drogheda's exhibition and are now on view at the Office.

Accounts.—Submitted—the following Statement of the Bank Account in the Cash Book :—

	£	*s.*	*d.*
Balance on 21st November, 1916	3,582	16	5
Receipts from 22nd November, 1916 to 23rd January, 1917	8,779	3	7
	12,362	0	0
Cheques drawn from 22nd November, 1916 to 23rd January, 1917 ...	6,269	0	5
Balance on 23rd January, 1917	£6,092	19	7

Submitted—The following Statement of Accounts for the Nine months ending 31st December, 1916, prepared for audit by the Comptroller and Auditor-General :—

RECEIPTS.								PAYMENTS.					
1915.					1916.			1915.					1916.
£ s. d.		£ s. d.		£ s. d.	£ s. d.			£ s. d.		£ s. d.		£ s. d.	£ s. d.
861 16 6	Balance from year 1915-16	—			2,208 15 5			750 0 0	Director	—			750 0 0
16,875 0 0	Parliamentary vote..	—			16,875 0 0			6,730 7 0	OFFICE SALARIES (including Insurance): Monthly	6,939 2 9			
								903 13 0	Weekly	1,214 19 0			
	DEPARTMENTAL EXPENSES REPAID:												8,154 1 9
3 19 5	Forecasts, &c. ...	2 0 6							EXPENSES OF OFFICE:				
	Marine, Statistical, and Administrative	49 7 1						513 13 9	Rent, Heating, and Lighting	346 0 11			
76 8 0								55 16 2	Furniture and Equipment	82 2 9			
102 3 7	Instruments ...	63 10 11						12 15 10	Library	19 3 7			
					114 18 6				Insurances and Repairs	73 5 11			
	INCIDENTAL EXPENSES REPAID:							258 0 3	Incidental Expenses, and Consumable Stores	182 15 0			
86 8 10	D.W. Report ...	60 19 10						15 16 8	Advertising Account...	5 12 6			
41 10 9	Divisional... ...	64 16 10											709 0 8
4 11 5	Advertising Account	4 17 7							POST OFFICE:				
					130 14 3			492 14 2	Postage	431 5 2			
52 1 0	STATIONERY OFFICE	—			40 18 10			87 1 0	Telephones	92 1 2			
								1,223 5 9	Telegrams	2,154 5 4			
	TELEGRAPH CHARGES REPAID												2,677 11 8
46 9 0	... ...	—			567 14 5			88 17 5	STATIONERY OFFICE...	—			70 1 5
								248 3 1	TRAVELLING EXPENSES	—			203 3 1
	TELEPHONE CHARGES REPAID								SUPERANNUATION:				
7 19 2	... ...	—			1 0 8				Pensions not chargeable on Fund ...	105 8 4			
								318 15 0	Pensions chargeable on Fund	206 14 0			
164 0 0	INSPECTIONS ...	—			148 0 0			194 14 10	Annuities	421 17 6			
								545 12 6	Contribution to fund.	—			
	INSTRUMENTS:							665 1 6					733 19 10
986 11 8	Royal Navy ...	2,012 19 0							COST OF INSTRUMENTS:				
1,037 17 11	Mercantile Marine, Stations, &c. ...	2,061 8 5			4,074 7 5			1,611 7 8	Royal Navy	3,233 13 4			
								66 7 4	For Office use ...	289 3 0			
	SUPERANNUATION ACCOUNT:							1,228 10 7	Other Commissions ...	3,754 17 1			
593 15 2	Annuities	433 2 6											7,277 13 5
16 6 9	Interest on Investments	32 2 2							*OBSERVATORIES, BRANCHES, AND STATIONS:				
					465 4 8			1,535 14 11	Kew	1,605 6 1			
	*OBSERVATORIES, BRANCHES, AND STATIONS:							1,045 14 1	Eskdale	1,203 15 2			
								481 18 2	Valencia	528 12 5			
375 4 8	Kew	465 2 8						353 17 3	Farnborough	458 15 5			
1,016 8 7	Eskdale	1,016 1 6						152 17 5	Falmouth	212 13 10			
23 10 9	Valencia	23 19 5						301 2 8	Benson	329 8 7			
268 3 6	Farnborough ...	277 13 0						285 6 0	Edinburgh	286 3 0			
6 4 2	Falmouth	10 10 6						1,016 2 8	Miscellaneous ...	1,061 10 8			
—	Benson	10 0 0											5,686 5 2
106 12 5	Miscellaneous ...	60 17 3							BALANCE:				
					1,863 4 4			1,524 3 2	Cash at Bank ...	142 15 1			
	LECTURES AND EXPERIMENTS ...	—			—			84 8 2	,, at Office ...	85 6 5			
9 4 9													228 1 6
£22,792 8 0					£26,489 18 6			£22,792 8 0					£26,489 18 6

* For details, *see* separate statement.

Statement of Assets and Liabilities at 31st December, 1916.

LIABILITIES.					ASSETS.			
£ s. d.		£ s. d.	£ s. d.		£ s. d.		£ s. d.	
2,432 15 6	To sundry creditors	3,405 3 7	1,608 11 4	By cash at Bank and at Office ...	228 1 6			
—	,, Superannuation	181 8 6	8 18 2	,, salaries reserved (premiums) ...	8 18 8			
1,705 12 7	,, balance	2,221 9 11	316 11 1	,, M.O. Instruments in Stock ...	417 14 2			
			1,022 11 0	,, sundry debtors	1,202 8 11			
			1,020 0 0	,, Admiralty	3,950 18 9			
			161 16 6	,, Superannuation	—			
£4,138 8 1		£5,808 2 0	£4,138 8 1		£5,808 2 0			

NOTE.—On 31st December the amount of Government securities held for the provision of Superannuation Annuities was £26 14*s.* 2*d.* 2½ per cent. Consols, and £702 10*s.* 2*d.* 4½ per cent. War Loan.

Observatories.—Statement of Accounts for the nine months ended 31st December, 1916 :—

KEW.

1915. £ s. d.	Receipts.	£ s. d.	1916. £ s. d.	1915. £ s. d.	Payments.	£ s. d.	1916. £ s. d.
123 0 0	Subvention, Scott Antarctic Fund	123 0 0		1,261 4 10	Salaries, Scheduled	1,275 7 9	
207 10 7	Gassiot Trust	274 11 7		21 14 8	Sunday and holiday duty	29 0 7	
			397 11 7				1,304 8 4
4 4 7	Expenses refunded locally		58 11 6	21 5 1	Cost of forms, &c.		23 8 3
30 11 6	Tests and Commissions		3 3 7	58 1 9	Rent, Rates, Taxes, Repairs and Insurance		66 18 7
9 18 0	Cost of books and forms refunded		4 16 0	69 10 2	Fuel and lighting		78 18 1
1,160 10 3	Balance		1,141 3 5	45 0 3	Equipment and instruments		57 9 10
				15 2 9	Consumable stores		32 9 9
				11 12 3	Incidental expenses		14 0 3
				2 4 6	Books, &c.		3 1 8
				29 2 2	Postage, telephones and telegrams		24 6 11
				16 6	Travelling expenses		4 5
£1,535 14 11			£1,605 6 1	£1,535 14 11			£1,605 6 1

ESKDALE.

£ s. d.		£ s. d.	£ s. d.			£ s. d.
1,000 0 0	Subvention, Royal Society	1,000 0 0	705 0 5	Salaries, Scheduled		756 5 9
16 8 7	Expenses refunded locally	16 1 6	48 16 8	Cost of forms, &c.		66 2 3
29 5 6	Balance	187 13 8	26 6 11	Rent, Rates, Taxes, Repairs and Insurance		3 1 6
			142 15 8	Fuel and lighting		23 3 11
			12 7 4	Equipment and instruments		37 10 3
			29 0 9	Consumable stores		20 1 11
			13 17 9	Incidental expenses		6 15 8
			2 16 0	Books, &c.		4 7 3
			32 16 7	Postage, telephones and telegrams		34 5 2
			31 16 0	Travelling and motor car expenses		252 1 6
£1,045 14 1		£1,203 15 2	£1,045 14 1			£1,203 15 2

VALENCIA.

£ s. d.		£ s. d.	£ s. d.			£ s. d.
6 0 9	Subventions (Rosse Fund)	5 9 5	363 1 9	Salaries, Scheduled		387 18 4
17 10 0	Expenses refunded locally	18 10 0	1 16 2	Cost of forms		2 9 10
458 7 5	Balance	504 13 0	66 8 9	Rent, Rates, Taxes, Repairs and Insurance		38 0 8
			14 15 6	Fuel and lighting		12 17 8
			13 17 0	Equipment and instruments		66 5 0
			4 12 1	Consumable stores		4 14 0
			18 0	Incidental expenses		16 8
			1 0 4	Books, &c.		1 8 0
			13 16 10	Postage, telephones and telegrams		14 2 3
			1 11 9	Travelling expenses		—
£481 18 2		£528 12 5	£481 18 2			£528 12 5

FARNBOROUGH BRANCH OFFICE.

£ s. d.		£ s. d.	£ s. d.			£ s. d.
250 0 0	Subvention (Advisory Committee for Aeronautics)	250 0 0	216 1 9	Salaries, Scheduled		33 12 3
18 3 6	Expenses refunded (War Office)	27 13 0	1 8	Cost of forms		—
85 13 9	Balance	181 2 5	7 9	Rent, Rates, Taxes, Repairs and Insurance		—
			—	Fuel and Lighting		4 5
			13 6 8	Equipment and instruments		345 0 7
			12 14 7	Consumable stores		18 8 4
			8	Incidental expenses		3 12 3
			2 15 0	Books, &c.		1 8 0
			65 8 3	Postage, telephones and telegrams		55 17 11
			43 0 11	Travelling and motor car expenses		11 8
£353 17 3		£458 15 5	£353 17 3			£458 15 5

FALMOUTH WEATHER STATION.

£ s. d.		£ s. d.	£ s. d.			£ s. d.
6 4 2	Expenses refunded locally	10 10 6	30 0 0	R. Cornwall Polytechnic Society		30 0 0
146 13 3	Balance	202 3 4	69 15 0	Salaries, Scheduled		93 13 3
			2 6	„ additional		—
			14 6	Rent, Rates, Taxes, Repairs and Insurance		34 2 11
			12 7 3	Equipment and instruments		1 7 2
			1 15 5	Consumable stores		1 0 11
			12 2	Incidental expenses		17 11
			23 8 4	Postage, telephones and telegrams		43 13 5
			14 2 3	Travelling expenses		7 18 3
£152 17 5		£212 13 10	£152 17 5			£212 13 10

BENSON.

1915.	*Receipts.*	1916.	1915.	*Payments*	1916
£ s. d.		£ s. d.	£ s. d.		£ s. d.
—	Expenses refunded locally ...	10 0 0	263 4 6	Salaries, Scheduled	261 9 9
301 2 8	Balance	319 8 7	1 0 6	Overtime, &c.	12 0
			—	Cost of forms, &c.	—
			2 0 0	Rent, Rates, Taxes, Repairs and Insurance	—
			13 0	Fuel and Lighting	1 10 0
			3 13 2	Equipment and instruments ...	28 5 1
			20 9 9	Consumable stores	16 18 6
			2 2 6	Incidental expenses	2 17 0
			—	Books, &c.	1 11 6
			7 19 3	Postage, telephones and telegrams	14 3 9
			—	Travelling expenses	2 1 0
£301 2 8		£329 8 7	£301 2 8		£329 8 7

METEOROLOGICAL OFFICE, EDINBURGH.

£ s. d.		£ s. d.	£ s. d		£ s. d.
285 6 0	Balance	286 3 0	262 10 0	Subvention	262 10 0
			22 16 0	Travelling expenses	23 13 0
£285 6 0		£286 3 0	£285 6 0		£286 3 0

MISCELLANEOUS STATIONS.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
106 12 5	Cost of forms refunded	60 17 3	258 7 6	Subventions, Aberdeen, Armagh	258 7 6	
909 10 3	Balance	1,000 13 5	42 10 0	British Rainfall Organisation ...	42 10 0	
						300 17 6
			534 11 1	Salaries of Observers (32)		552 14 0
			6 0	Overtime, &c.		—
			118 12 0	Cost of forms, &c.		125 18 6
			9 0 8	Rent, Rates, Taxes, Repairs and Insurance		5 15 6
			1 13 3	Equipment and instruments ...		9 14 10
			14 3	Consumable stores		19 6
			35 1 0	Agents' fees, &c.		30 19 0
			5 13 6	Books, &c.		4 7 0
			9 13 5	Postage, telephones and telegrams		30 4 10
£1,016 2 8		£1,061 10 8	£1,016 2 8			£1,061 10 8

METEOROLOGICAL FIELD SERVICE.

FRANCE.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
280 9 10	War Office	167 6 11	131 14 4	Major E. Gold	25 18 8	
351 9 9	Balance	120 19 0	44 2 6	Capt. A. E. M. Geddes	—	
			28 15 6	Capt. A. H. R. Goldie	12 1 8	
			—	Lieut E. H. Chapman	—	
			20 19 6	Lieut. C. D. Stewart ...	—	
			7 6 10	Lieut. F. Entwistle ...	—	
			17 8 9	Lieut. J. G. Lamb ...	—	
			12 2 9	Sergt. R. Pyser ...	29 12 6	
			10 0	Corpl. E. L. Clinch ...	25 11 0	
			—	Corpl. A. G. Goad ...	46 5 4	
					139 9 2	
				Cr.—Amounts refunded	84 4 8	
						55 4 6
			5 19 8	Salaries: Overtime ...	—	
				Incidental Expenses:		
			6 16 9	Postage	16 14 10	
			—	Telegrams	—	
			13 5	Printed books ..	—	
			7 19 5	Miscellaneous ...	12 6	
						17 7 4
			347 10 2	Instruments		215 14 1
£631 19 7		£288 5 11	£631 19 7			£288 5 11

SALONIKA.

£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.
—	Admiralty	124 5 6	15 12 6	Salaries: Capt. E. M. Wedderburn	—	
—	War Office	597 9 1	1 15 0	Lieut. E. Kidson ...	—	
234 14 11	Balance	449 10 0	—	Corpl. C. V. Ockenden	13 16 10	
						13 16 10
			24 9 1	Salaries: Overtime		19 10 6
				Incidental Expenses:		
			9 4	Postage	8 11 0	
			—	Telegrams	754 13 10	
			—	Printed Books ...	—	
			9 9 0	Typewriter	—	
			2 19 10	Miscellaneous ...	1 11 8	
						764 16 6
			180 0 2	Instruments		373 0 9
£234 14 11		£1,171 4 7	£234 14 11			£1,171 4 7

SEVENTY-SEVENTH MEETING.

South Kensington, S.W. 7, 28th March, 1917.

PRESENT:

THE DIRECTOR, IN THE CHAIR.

MR. BARSTOW.	MAJOR LYONS.
THE HYDROGRAPHER.	DR. SCHUSTER.

627. The Minutes (618–626) of the last Meeting (24th January, 1917), previously circulated, were taken as read and confirmed.

628. TWELFTH ANNUAL REPORT.—It was agreed to prepare the Report in the usual form, and to ask the Stationery Office to print an abridged edition as last year.

629. CORRESPONDENCE.—**Committee for the Investigation of Atmospheric Pollution.**—Read—the following letter (M.O. 0842) :—

Department of Scientific and Industrial Research,
Great George Street,
Westminster, S.W. 1,
12th March, 1917.

SIR,

THE Committee of the Privy Council have considered the recommendation of the Advisory Council upon the application of the Committee for the Investigation of Atmospheric Pollution for a grant in aid of their investigations, and are prepared to make an immediate grant of £500 towards the expenses of the Committee for the period 1st January, 1917, to 31st March, 1918, on condition that the Committee is constituted an Advisory Committee to the Committee of the Meteorological Office, to which latter body the grant will be paid.

The grant will also be subject to the conditions set out in the enclosed schedule, and will be paid as soon as this Department has been informed of the acceptance of the conditions attached to the grant, and of the name and address of the person to whom it is desired that payment should be made.

A copy of this letter and enclosure will be sent to Dr. Owens.

I am, &c.
H. FRANK HEATH.

Sir Napier Shaw, LL.D., Sc.D., F.R.S.,
Meteorological Office,
South Kensington, S.W.

COMMITTEE OF THE PRIVY COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH.

CONDITIONS APPLYING TO THE GRANT IN AID OF THE INVESTIGATION INTO THE POLLUTION OF THE ATMOSPHERE.

1. The investigations will be directed by an Advisory Committee to the Committee of the Meteorological Office. The Advisory Council reserve the right to appoint a representative on the directing committee.

2. The Committee of the Meteorological Office will secure that the number of local centres in which investigation into the pollution of the atmosphere is carried on under the supervision of the directing committee shall not fall below the number of such centres existing on January 1st, 1917, and will be responsible for securing that the cost of the gauges used in these local centres and the analyses for local purposes of the results obtained will be borne by the Local Authorities interested.

3. A grant of £500 will be paid to the Committee of the Meteorological Office towards the cost of maintaining a station in London as a control station under the immediate supervision of the Advisory Committee and the cost of supervising, compiling, collating and discussing the results obtained at the local centres and the control station. The Committee of the Meteorological Office will keep a separate account of the receipts and payments in respect of this work.

4. Any plant, apparatus, instruments or other equipment provided for the purpose of the investigations by the Committee of the Meteorological Office during the period in respect of which the grant is made will be entrusted to the Committee of the Meteorological Office; but the Department of Scientific and Industrial Research reserves the right to determine, in consultation with the co-operating bodies and persons, the ultimate disposal of such plant, apparatus, instruments and other equipment.

5. If it is proposed to charge to the cost of the investigation any sum paid to any salaried official of a Public Educational Institute, the facts should be submitted to the Department beforehand, with information as to whether the proposal has received the approval of the Governing Body of the Institution.

6. Before they can agree to make further grants for annual periods from April 1st, 1918, the Committee of Council must be satisfied that the work is progressing satisfactorily, and that all the conditions agreed upon are observed. Audited accounts for the period ending March 31st, 1918, together with a report on the progress of the investigations, should be forwarded to the Department as soon as possible after 31st March, 1918. Similar accounts and reports for subsequent annual periods will be required in the event of further grants being made. Each report should give particulars of any plant, apparatus, instruments or other equipment provided by the Committee of the Meteorological Office for the purposes of the investigations during the period covered by the report.

7. If the total expenditure on the investigations for any period is less than the estimated expenditure on which the grant has been calculated, the balance of grant will be returned to the Department, or, if a contribution is made for a further period of work, may be carried forward as part of that contribution.

8. The Committee of Council on the advice of the Advisory Council have decided to attach to this grant the following conditions :—

(*a*) The results of the investigations shall be made fully available unless the Department of Scientific and Industrial Research, in consultation with the co-operating bodies, determine otherwise ;

(*b*) If it is decided not to make the results fully available, the Department, in consultation with the co-operating bodies, shall determine the extent to which, and the conditions under which the results shall be made available ;

(*c*) The Department reserves the right to determine, in consultation with the co-operating bodies and persons, to what extent and in what proportion the Department and the co-operating bodies and persons shall secure to themselves by patents or otherwise a share in any profits that may be derived from the results of the investigation.

If, therefore, in the course of the investigation, results appear which, in the opinion of the Committee of the Meteorological Office, should be protected by the grant of a patent or by other means, the Committee should communicate with the Department without delay.

Reported—that explanation had been asked as to the responsibility which the Committee would undertake under the proposed scheme in relation to Article 2 and that a reply (M.O. 842/2) had been received on 24th March.

It was agreed (1) that the persons named herein, with the Director of the Meteorological Office as Chairman, *ex officio*, be constituted an Advisory Committee to direct the further investigation of atmospheric pollution and to advise the Meteorological Committee as to the expenditure of the grant made by the Department of Scientific and Industrial Research, in accordance with the conditions laid down in the letter of the Department, dated 12th March, 1917, until 31st March, 1918.

List of Members of the Advisory Committee.

Sir Napier Shaw, F.R.S., Director of the Meteorological Office (*ex officio*).

Captain C. J. P. Cave (Past President of the Royal Meteorological Society).

Mr. J. G. Clark.

Professor J. B. Cohen, B.Sc., Ph.D., F.R.S. (Professor of Organic Chemistry, Leeds University).

Dr. H. A. Des Voeux (Hon. Treasurer, Coal Smoke Abatement Society).

Mr. J. B. C. Kewshaw, F.I.C.

Dr. R. Lessing, F.C.S.

Dr. J. S. Owens (Coal Smoke Abatement Society).

Dr. E. J. Russell, Director of the Rothamsted Experimental Station, Harpenden.

Bailie W. Smith (Convener of the Air Purification Sub-Committee of the Glasgow Corporation).

Mr. S. A. Vasey, F.I.C., F.C.S. (Director of the Lancet Laboratory).

Mr. F. J. W. Whipple (Superintendent of the Statistical Division, Meteorological Office).

Provided that any Municipal Authority co-operating with the Committee by the installation and maintenance of one or more gauges and the analysis of the products may nominate a representative to be appointed by the Meteorological Committee to hold office as an additional member of the Advisory Committee during the pleasure of the Municipal Authority nominating him.

Provided also that the Advisory Committee may at any time recommend to the Meteorological Committee for appointment, the names of additional members of the Committee.

(2) That in the event of the investigation being continued beyond 31st March, 1918, the constitution of the Committee be continued upon terms to be approved by the Meteorological Committee and the Department of Scientific and Industrial Research.

(3) That the accounting officer of the Meteorological Office authorise payments out of the grant for the investigation of atmospheric pollution upon a certificate of recommendation by the Advisory Committee in such form as the Advisory Committee may direct, provided that the payments are not contrary to any of the conditions laid down by the Department of Scientific and Industrial Research in their letter of 12th March, 1917.

Mr. Scott's Library.—(Minute 605).—Reported—that Mr. Orpen Stewart, the legatee of Mr. R. H. Scott, had presented to the Office for the use of Valencia Observatory, the books from Mr. Scott's library, which had been withdrawn from the auction sale on 20th October, 1916, and that they had been accepted with thanks.

Air Board.—Read—the following letter (M.O. 5202):—

War Office,
Adastral House,
Victoria Embankment, E.C.
7th February, 1917.

SIR,

IT is desired to make arrangements for the copying for instructional purposes of drawings of engines and other aeronautical equipment, and I am directed to enquire whether you would be able to assist the Department in this respect.

It is understood that Major Armes has already explained to you the nature of the work required and its probable extent, and that you have plant and labour available.

I should be glad if you will state how far you are prepared to undertake the work and the terms on which you would propose doing it.

I am, &c.,
E. C. BLIGHT,
For Director General of Military Aeronautics.

Sir Napier Shaw,
Director of the Meteorological Office,
Exhibition Road, S.W.

The Director reported that no responsible official at the Office had any knowledge of Major Armes' visit, but that the lithographer's artist had received a visit from an army officer, who had expressed the opinion that the M.O. press would serve his purpose. In reply a letter had been written stating that the press was already fully occupied, and that extra work could not be accepted at present.

Post Office Charges.—Read—the following letter (298/X.02) from the Post Office regarding attendances at South Kensington Branch Office outside ordinary hours :—

General Post Office,
London,
19th January, 1917.

SIR,

CHARGES FOR SPECIAL ATTENDANCE AT SOUTH KENSINGTON BRANCH OFFICE.

WITH further reference to your letter of the 7th of October last, X. 02, I am directed by the Postmaster General to state that the account for the quarter ended the 30th of June last, in respect of special attendance at the South Kensington Branch Post Office on behalf of the Meteorological Office was prepared on the old basis of charging, pending settlement of Summer Time rates, and that the sum overcharged has been allowed in the account, recently rendered, for the period ended the 30th September last.

I am to add that the charges for special attendance for the receipt or despatch of telegrams at postal telegraph offices generally have been revised, as it was found that under the method of calculation hitherto employed the charges made did not fully represent the cost of attendance provided, and that from the 1st of August last the charges in respect of the South Kensington office will be at the rate of £8, instead of £5 per annum, during the periods when the Daylight Saving Act is in operation, and at the rate of £105 per annum for the rest of the year, so long as special attendance is not required in connexion with the Atlantic Weather Reports. When the despatch of these reports is resumed the Winter charge will be at the rate of £130 per annum.

I am, &c.,
A. B. WALKLEY.

The Director,
Meteorological Office.

Read—the following memorandum on the subject :—

MEMORANDUM.

	£	s.	d.
10th March, 1911—Post Office suggested for special attendance, 7 a.m.—8 a.m. weekdays and 7 a.m.—8.30 a.m. and 8 p.m.—8.30 p.m. Sundays	366	18	8½
11th April, 1911—Post Office regret error in claim of 10th March, 1911, and say it should be	73	1	0
26th January, 1913—Charge reduced, since 8 p.m.—8.30 p.m. duty cancelled, to ...	67	10	0
1st August, 1916—A charge of £8 for 7 h.—7.30 h. G.M.T. Sunday.			
19th January, 1917—Notifying that charges will be :—			
During operation of Daylight Act at £8 per annum	4	0	0
Remainder of year at £105 per annum	52	10	0
Total	56	10	0
When Atlantic Reports are resumed at £130 per annum for Winter half-year, *i.e.*, an increase of	12	10	0
Total	69	0	0

	Previously. £ s. d.	Now proposed. £ s. d.
Summer Time	2 5 0	4 0 0
Winter half-year	33 15 0	52 10 0
	36 0 0	56 10 0
		+ 57 per cent.

It was agreed to pay the charge, and, if necessary, to raise the general question at a later time.

Hydrographer.—*Station at Malta.*—Reported—that T. Agius, M.D., Professor of Physics in the University of Malta, and Curator of the Meteorological Observatory which supplies the daily reports by cable for the Meteorological Services of this country, the Mediterranean, Egypt, France, Italy and Spain, had forwarded an appeal for higher remuneration (M.O. 5188 & C. 11c.) 26th January, 1917, in consideration of the additional work undertaken in compliance with requests from this Office, which had been refused by the authorities of the University. It appears from the correspondence that Professor Agius, who fills a number of offices, still relies upon his medical practice and considered the work incidental to sending an evening report to Salonika to be detrimental thereto.

On the receipt of the appeal the question had been raised with the Admiralty through the Hydrographic Office, whether it would not be desirable to have a regular Meteorological establishment at Malta in charge of a competent meteorologist which would take and map, for the use of the Naval Authorities, the information which already passes over the cables which land at Malta, and could therefore be obtained with little trouble or additional cost.

The following reply, M.O. 5188(3), has been received :—

Hydrographic Department,
Admiralty, London, S.W.,
24th March, 1917.

SIR,

I BEG to acknowledge the receipt of your letter of the 8th instant, with reference to the establishment of a Meteorological station at Malta and to inform you that I am unable at present to propose any action in the matter as the new arrangements regarding the formation of a Naval Meteorological Service are not yet completed, but as soon as this is carried out I will write to you further on the subject.

I am, &c.,
J. F. PARRY,
Hydrographer.

The Director,
Meteorological Office,
South Kensington, S.W. 7.

Oxford, Radcliffe Observatory.—Reported—the following letter, which it is proposed to send to the Radcliffe observer :—

Meteorological Office,
South Kensington, S.W.,
31st March, 1917.

SIR,

ON going through the payments to the telegraphic reporting stations, my attention has been called to the fact that we are still making a payment of £14 6s. a year to the Radcliffe Observatory, as a survival from the time when we had daily telegrams. As we have now come to the end of another financial year and are as everybody is, in straitened circumstances, I suppose I cannot pass the question of this payment. I am less reluctant to do so because among other useful purposes which the observations from Oxford served, was that of the Weekly Weather Report for which continuity of exposure, &c. is required. In view of the necessity for this continuity the Committee authorised

the recognition of the services of observers by allowing a payment where payment was required, of £8 per annum, so I can, with a clear conscience, continue to pay you £8 a year if you will go on with the weekly schedules.

I have no authority beyond that. We shall of course like the monthly results continued, but they form part of the collection of data for the "public memory," and for that we have to act upon the principle that the duty of the Office is only to afford an opportunity for prompt publication and comparison with corresponding values for other places.

I am, &c.,
NAPIER SHAW.

Dr. A. A. Rambaut, F.R.S.,
Radcliffe Observatory,
Oxford.

Approved.

War Office.—*Chief Censor.*—Read—the following letter (5322/C. 11 F) from the War Office with reference to the censorship of meteorological publications posted to addresses abroad :—

17569 (M.I. 9a.)

War Office,
London, S.W.,
27th March, 1917.

SIR,

I AM directed to inform you that the question of the export from this country of Meteorological Reports has recently arisen in connexion with the publications of this nature which the Royal Meteorological Society desire to send abroad.

It is understood that the Admiralty have already consulted you on the matter and are of opinion that the export of the British Quarterly Journal may be allowed provided that each issue is passed by the Meteorological Office as containing no information likely to be of value to the enemy during the present war.

Further it is suggested that the contents of the Monthly Weather Report are such that copies should only be allowed to proceed to official bodies in neutral countries.

With regard to neutral weather reports found in the mails censored in this country it is proposed that copies should be submitted to your Department before they are allowed to proceed to any destination either in this country or abroad.

I am to state that if you are prepared to concur in these proposals, the necessary measures will forthwith be taken to put them into operation.

I am, &c.,
G. S. H. PEARSON, Lieut.-Col., G.S.,
for Director of Special Intelligence.

The Director,
Meteorological Office,
Exhibition Road, S.W. 7.

Submitted—the following draft reply :—

29th March, 1917.

SIR,

I BEG to acknowledge the receipt of your letter 17569 (M.I. 9A) of the 27th instant, relating to the control of Meteorological Publications despatched from or received in this country.

1. I concur in your suggestion that the Quarterly Journal of the Royal Meteorological Society should be allowed to be issued to its Fellows residing abroad, provided that it contains no information likely to be of value to the enemy.

   I would suggest that the same procedure be adopted for the Symons Monthly Meteorological Magazine, published by the British Rainfall Organization, at 62, Camden Square, N.W., and the annual publication "British Rainfall" of the same institution; also the Annual Report of the Scottish Meteorological Society of 122, Great George Street, Edinburgh.

2. I shall be glad to examine any of these publications which you may direct to be sent to this Office, and to report upon them.

3. I note that the War Office desire that the Weekly and Monthly Weather Reports of this Office, if sent out of this country, should be supplied only to official bodies and institutions of neutral countries to which I presume are to be added those in the British Empire overseas, and Allied Countries.

4. I shall be glad to report to you upon any meteorological matter found in the mails on which you may desire a technical opinion.

I am, &c.,
NAPIER SHAW.

The Director of Special Intelligence,
War Office, M.I. 9A,
Whitehall, S.W. 1.

Approved.

630. OFFICE STAFF.—**Dr. Crichton Mitchell** (Minute 574)—Read—letter 657 (D.W./16) of 20th February from Dr. Crichton-Mitchell, Superintendent of the Observatory, Eskdalemuir, whose appointment under Minute 574 will terminate on 15th May, 1917, stating that he is willing to remain at Eskdalemuir until the close of the War and for such time thereafter as may be necessary for a decision as to the future, provided his health is satisfactory.

Approved.

H. J. Bigelstone.—Reported—that H. J. Bigelstone, boy clerk in the Instruments Division, had left the Office without notice on 20th March, and had enlisted in the Royal Flying Corps.

It was agreed that in these circumstances the Committee should take no action in regard to the question of making good his Civil pay.

J. F. Duffin.—Reported—that J. F. Duffin, Professional Assistant in the Forecast Division had obtained a commission as 2nd Lieutenant in the Royal Engineers ("London Gazette," 17th March), and had been attached to the Meteorological Section in France.

Reported the following applications :—

E. J. Hood.—Letter 940, dated 26th March, asking for an improvement in salary on the ground of increased work at the Office and increased cost of living.

A. T. Bench.—Letter of 22nd February asking for speedy promotion upon reaching the salary limit of a clerk.

W. H. Parsons.—Letter 787 of 8th March asking for his deferred pay to be paid to him monthly instead of being invested with a view to a pension.

C. E. Goad.—Letter 819 of 9th March asking to be placed in a position to receive a small superannuation.

With regard to the above applications it was reported by Mr. Barstow that a Treasury Committee is now enquiring into the adequacy of the War Bonus, and that the report of this Committee is expected to be issued shortly.

It was agreed to await the findings of this Committee before taking action.

Reported—Order 570, allowing an increase in wages of 1*s.* 6*d.* per week to Messengers G. R. Parker and L. Featherstone in consideration of extra work in connection with the evening round which is taken by these two messengers alternately. Also allowing an increase in wages of 1*s.* 6*d.* a week to Messenger W. G. Palmer on transference from the Correspondence and Accounts Section to the Library. Also allowing an increase in wages of 3*s.* a week to Packer's Assistant J. E. Bassett, and 2*s.* 6*d.* a week to Messenger A. H. French.

Approved.

Read also—the following :—

Miss E. V. Turney.—Letter 661 of 1st February asking for promotion to a higher class with a substantial increase in salary.

Miss K. R. Corrin.—Letter 4052 of 12th December, 1916, asking for promotion to a position on permanent staff.

Miss Brierley.—Reported—that Miss Brierley who is engaged as clerk at the Branch Meteorological Office, South Farnborough, had applied for an increase of wages and that her application was supported by Captain Cave's recommendation.

It was agreed to increase her wages to 30*s.* a week and to recover the amount from the War Office in the usual manner.

Salary list 1917–18.—Submitted—the following recommendations :—

Superannuation list :—

To be retained for duty under Minute 591—

H. Harries.
W. Allingham.
W. G. James.

Promotions incidental to the retirements on superannuation :—

To be Principal Clerks :—

H. L. B. Tarrant, Secretarial Staff, from Staff Assistant. (Dated from 1st March, 1917.)
E. Boxall (Kew Observatory) from Staff Assistant.

To be Staff Assistants :—

E. J. Hood, Secretarial Staff, from Staff Clerk.
J. H. James, Instruments Division, from Mechanical Assistant (Dated from 1st October, 1916).
P. N. Skelton, Eskdale Observatory, from Clerk Assistant.
H. Keeton, Marine Division. From Staff Clerk (dated from 1st October, 1916).

To be Staff Clerks :—
Miss D. G. Chambers, Secretarial Staff from Clerk Assistant.
J. B. Phillips, Falmouth Observatory, from Clerk Computer.
To be Clerk Assistants :—
Miss E. V. Turney, Secretarial Staff, from Clerk Computer. (With special additional increment of £10 per annum).
Miss N. L. Despicht, Statistical Division, from Probationer.
Miss W. A. Quennell, Secretarial Staff, from Probationer.
A. J. Tabor, Forecast Division, from Probationer.
To be Clerk Computers :—
Miss R. M. Chambers, Secretarial Staff, from Girl Clerk (Dated from 1st December, 1916).
Miss K. R. Corrin, Accounts Division, from Girl Clerk.

Approved.

Probationers and Boy-Clerks.—In view of the regulation of the War Office permitting boys of 17½ years of age to join up, appointments as probationer under regulation 11 in Circular 002 will not be made this year, but in consideration of progress in their work, the following Boy Clerks will be allowed pay at probationer's rates, and will come up for favourable consideration on a future occasion :—

A. H. Lupton, Kew Observatory.
W. J. Fowler, Falmouth Observatory.

In consideration of satisfactory attendance on the gas-engine, J. P. Price at Kew Observatory is allowed a special increase of wages of 5*s.* a week.

Normal Increments, 1917-18.—The Director was authorised to make the normal additions to the salaries as from 1st April, 1917, upon satisfactory reports from the respective superintendents with a supplementary increase of 4*s.* a week as war bonus, making in all an increase of 6*s.* a week in the case of Alfred Stonier, mechanic at Eskdalemuir.

New Appointments.—Reported—the following orders for confirmation :—*P. Y. Alexander.*—Order 557, appointing Mr. Patrick Y. Alexander Honorary Senior Professional Assistant and Meteorologist in charge of the Weather Station, Falmouth, from 23rd February until further order.

F. W. Beaver.—Order 545 appointing F. W. Beaver, born 18th June, 1900, as an assistant in the Forecast Division from 1st January, 1917. The commencing salary is 19*s.* 6*d.* a week and the Forecast Division allowance of 25 per cent. extra for duty at irregular hours and on Sundays is added, so long as he is in full duty with the Forecast Division.

Miss M. L. Taylor.—Order 547 appointing Miss Marjory Lucy Taylor, born 16th April, 1901, as girl clerk from 22nd January, 1917, on the usual terms, to fill a vacancy caused by a new office in the Forecast Division referred to below.

A. Woolley.—Order 550 appointing Anthony Woolley as office keeper in place of A. L. Goodwin (Minute 623), to date from 5th February, 1917, at a salary of 35*s.* a week with a War Bonus of 4*s.* a week. He will divide with the other office keepers the duty of being in attendance in charge of the Office from 7.30 a.m. to 8.30 p.m., and will take his turn for Sunday attendance from 6 p.m. to 8.30 p.m. for which a special pay of 3*s.* per Sunday will be allowed.

J. C. Woods.—Order 563 appointing John Charles Woods, born 1st March, 1903, as office boy and messenger at 7*s.* 6*d.* per week rising to a salary of 10*s.* per week after six months approved service, with additional 2*s.* a week War Bonus, to date from 20th March, 917.

Approved.

Reported—that in view of the transference of the Forecast Division to the third floor of the Office building (*see* Minute 631) it is found necessary to provide a shorthand-typist in that division, and it is proposed to move Miss R. M. Chambers from the Accounts Section to that post, and Miss K. R. Corrin to the Accounts Section. Miss Taylor (*see* above) has come in to fill the vacancy thus created.

Approved.

National Service.—The Director reported that after consultation with Officers of the National Service Department, a number of National Service Forms had been obtained and distributed among the male members of the staff between the ages of 18 and 61

with the request that they be returned for forwarding to the National Service Department. The work of the Meteorological Office had been explained to the Officers of the National Service Department. In the meantime a question had been asked in the House of Commons respecting the salary which it is proposed to pay to civil servants whose services are required by the Director-General of National Service, and the reply of Mr. Baldwin on 8th March was to the effect that under the national service scheme civil servants will be guaranteed the appropriate rate of pay for the work to which they are sent, and the period of absence from their departments will be treated as special leave without pay and will not count for a pension.

In these circumstances the National Service Forms have been returned to the members of the staff in order that they may deal with them as they think fit.

Reported—that there are two voluntary workers in the Office, namely, Mr. C. W. Broadbent (Minute 614) and Mr. Raphael Nahon who has attended since Monday, 5th March. They are now engaged upon the compilation of statistics of wind at the various telegraphic reporting stations on the coasts of the British Isles.

Mr. Broadbent has asked for some form of remuneration and general authority is required for payment of a fixed salary to these voluntary workers whose case is similar to a volunteer under the National Service scheme.

It was agreed that the Director be authorised to assign, at his discretion, a salary of £75 a year for full-time work to voluntary workers of the kind specified.

Payment for Early Morning Observations at Kew Observatory.—Reported—that the caretaker of Kew Observatory, whose duty it is to take the 7h. observations for the Daily Weather Service, had recently been seriously ill, and that failing the appointment of a deputy by the caretaker in accordance with the regulations, provision had to be made for the observations by calling upon one of the members of the staff whose duty does not normally begin until 9h.

It was agreed in these special circumstances to allow 2*s*. for each special attendance at 7h. to a member of the staff called upon to take this duty.

631. Office Organisation and Buildings (Minute 620).—Reported—the following Order 553 dated 20th February, 1917 :—Correspondence.—In view of the number of meteorological questions of national importance that require the Director's personal attention, Major Lyons will take over until further order :—

1. The general supervision of the Office letters, reporting only those which cannot otherwise be disposed of.
2. The general supervision of the supplies of instruments and stores carried on by Division 4.

Approved.

Loan of rooms by Board of Education (Minute 620).—Reported—that it had been arranged informally with the Director of the Science Museum for four of the rooms on the third floor of the building to be allotted to the Forecast Division for the duration of the War. The arrangements for the transfer are now in progress.

It is proposed further to move the staff of the Marine Division from Rooms 16 and 18 to Room 25, now occupied by the Forecast Division, and to move the Marine Superintendent from Room 8 to Room 26, now occupied by the Superintendent of the Forecast Division. The two Rooms 16 and 18 will be allotted to the Instruments Division. Room 8 will be available for the Secretarial Section and the Director's personal staff.

In connection with these changes and with a request from the Stationery Office to forward for pulping all available used paper it is proposed to destroy the Meteorological Logs falling in the category "good," as distinguished from "excellent" and "very good," also the stocks of Monthly Meteorological Charts up to 1912.

Approved.

Printing at Meteorological Office.—(M.O. 600).—Reported—that Mr. A. G. W. Howard of the Forecast Division had submitted an estimate of the cost of the provision of a suitable printing press and staff to work it, at the Meteorological Office, to be worked in conjunction with the lithographic press for the purpose of producing at short notice statistical tables, forms, &c.

632. OBSERVATORIES.—**Valencia.**—*Compulsory Tillage* (Minute 621).—Reported—that the Superintendent of Valencia Observatory had carried out the arrangement referred to in Minute 621, and had forwarded the new agreement with Mr. Leslie in regard to the grazing land, and agreements with three other tenants to whom allotments in the anemometer-field had been let.

Appointment of Superintendent as J.P.—The Director reported that he had sanctioned the acceptance of the office of J.P. by Mr. L. H. G. Dines, as it was represented that other suitable persons were not available in that district.

Eskdalemuir (Minute 497).—Reported—that a letter dated 29th January, 1917 (421/C.E. 23), had been received from H.M. Office of Works, Edinburgh, forwarding drawings showing the proposed modifications of the ventilating system at the underground magnetic chamber at Eskdale Observatory, and an estimate of the cost of the work. Of this £65 is chargeable to the Office of Works and £35 to the Meteorological Office, excluding the Stevenson screen and non-suction cowl to be provided by this Office at the outlet of the system.

It was agreed to approve the expenditure provided that the details are found to be satisfactory.

633. DIRECTOR'S REPORT AND ACCOUNTS.—**Lectures.**—The Director reported that as Reader in Meteorology for the University of London he had delivered a course of lectures on "Five Laws of Dynamical Meteorology" at the Meteorological Office on Friday afternoons, commencing 26th January and ending 16th March.

Discussions.—Reported—that the usual evening discussions of important recent contributions to Meteorological Science had been continued during the winter on alternate Mondays at 5 p.m., from 23rd October to 4th December, 1916, and from 15th January to 26th March, 1917.

Publications.—Copies of the third edition of the Weather Map and Meteorological Glossary were placed on the table. The demand for these publications continues, and it seems probable that a fourth edition will soon be called for.

Observations of wind near the ground.—Submitted—a note by Major G. I. Taylor, on a paper of Professor Hellmann of the Prussian Meteorological Institute, on the increase of wind velocity with height as observed at the German wireless station at Nauen.

Travelling Expenses.—Reported—the payment of an account for 14*s.* 9*d.*, being the travelling expenses of E. G. Bilham, Professional Assistant at Kew Observatory, now temporarily on duty at Benson, in respect of a railway fare from Benson to Richmond and back, incurred in consequence of receipt of Office instructions to be medically examined at his recruiting office, which is in Richmond.

Approved.

Accounts.—Reported—that the members of the Staff of the Office and observatories had agreed to take up £1,015 of 5 per cent. stock War Loan, 1929–47 on the terms offered to departments of the Civil Service, namely, £800 to be subscribed by monthly payments, and £215 by weekly payments, and that Mr. J. A. Curtis had agreed to act as the representative of the Office for the collection of the money and the payment to the Treasury.

Submitted—the following Statement of the Bank Account in the Cash Book :—

	£	*s.*	*d.*
Balance on 23rd January, 1917	6,092	19	7
Receipts from 24th January to 27th March, 1917	2,334	1	2
	8,427	0	9
Cheques drawn from 24th January to 27th March, 1917 ...	5,617	19	10
Balance on 27th March, 1917	2,809	0	11